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THE MEASUREMENT OF  
COLONIAL NATIONAL INCOMES:  
AN EXPERIMENT



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THE MEASUREMENT OF  
COLONIAL  
NATIONAL INCOMES:  
AN EXPERIMENT

By  
PHYLLIS DEANE

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### *Occasional Papers*

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## FOREWORD

THIS enquiry into the Measurement of Colonial National Incomes had its first beginnings in the autumn of 1941. It will be remembered that, soon after the outbreak of war, Lord Keynes, in a pamphlet which he called *How to Pay for the War*, laid down the broad principles governing the diversion of national resources from consumption and investment to the prosecution of war, and with Erwin Rothbarth's assistance made some attempts at measuring the orders of magnitude. In the early months of 1940 Mr. James Meade and Mr. Richard Stone were invited to join the Central Economic Intelligence Staff of the War Cabinet Offices (later to become the Economic Section of the War Cabinet Offices and the Central Statistical Office), and to undertake the task of measuring the national income and its composition for the purposes which Lord Keynes had outlined. The techniques that they jointly devised were published in the *Economic Journal* of June-September, 1941.

Once the new techniques had been published it was natural to ask whether these, with the threefold approach through income, output and expenditure, were capable of universal application not only to the national income of the United Kingdom, but also to that of other countries, both advanced and primitive. The subsequent history of their general and widespread adoption and their development into a system of social accounting approved by the Committee of Statistical Experts of the League of Nations<sup>1</sup> need not here be described. Any test of their application to the measurement of a more primitive national income was more difficult, since very few attempts had been made to measure colonial national incomes, and none of them were in a form which readily permitted an already accumulated body of data to be rearranged to see whether it could be used to exploit the advantages of the new techniques. Indeed, the development of the measurement of colonial national incomes was in itself almost a path-breaking task, which was capable of yielding great dividends in knowledge of the economic structure and standards of the colonial territories, the limits of which I myself had learned to appreciate in working with Lord Hailey on his *African Survey*.

Mr. Meade and Mr. Stone joined me in approaching the National Institute of Economic and Social Research with the proposal that it should assist us with a grant to enable us to find a suitable research worker who might attempt the task of measuring certain colonial incomes, and so discover by experiment the possibilities and limitations of the techniques in which we were interested, and, as we hoped, at the same time throw light on the problems of the selected territories. We are greatly indebted to the National Institute, who adopted the enquiry as an integral part of its research programme, appointed a research worker to its staff to undertake the work, and gave us continued support and interest throughout the whole period of the enquiry.

<sup>1</sup> *Report of the Sub-Committee on National Income Statistics*, and Appendix to the Report: *Definition and Measurement of the National Income and Related Totals*, by Richard Stone, 1947

We had great good fortune in finding Miss Deane to undertake the work. If the original impetus came mainly from us, the subsequent work was entirely her's. We followed the usual method of the National Institute, in that we three became Miss Deane's Advisory Committee. At a later date, when we came to tackle Jamaica, Mr. Arthur Lewis joined the committee to remedy our inexperience of West Indian conditions; but his influence has affected the whole study in its later stages of revision. To our regret, Mr. Meade had to drop out through pressure of other work at the beginning.

The task of the Advisory Committee was that of critics. The constructive work was entirely that of Miss Deane, and she brought to it an immense zeal and thoroughness. But she would, I know, wish me to emphasise, as she does herself, one thing. The research was conducted in London and in war-time. Her original and main objective was the testing of techniques. There were limitations of available data. There were limited possibilities of verification by correspondence, because of difficulties of communications and because the men in the field were already overloaded and shorthanded because of the war. Above all, verification by field investigation on the part of the research worker herself was, for the time being, precluded. Thus this study is in every sense an interim report. Since the end of the war Miss Deane has been able to examine many of the African problems at first hand, and she hopes to be able to improve her estimates in due course.

We began with Northern Rhodesia, mainly for two reasons. We thought, perhaps wrongly, that it was a relatively simple territory with which to start. More important, I myself had, in virtue of the studies in which I had shared on the Merle Davis Commission of the International Missionary Council, a just sufficient background of local knowledge to prevent some of the more obvious errors and to eke out the limited statistical material. Northern Rhodesia proved in practice to be interesting mainly in two respects. First, it forced us at a very early stage to consider the extremely difficult problems of valuation in a self-subsistence economy. Second, it forced us to ask *whose* incomes we were attempting to measure. Miss Deane has indicated the difficulties, both logical and practical, of the first. I will not embroider on them here. The second problem was less formidable. The copper mines, which are a main source of the wealth of the territory, have been developed by capital that is owned almost entirely outside the territory. A study of national incomes rigidly confined—following normal precedents—to the actual residents in the territory would exclude a great deal of the income that is in fact taxable for the purposes of the territory, and would for very many purposes be inappropriate. After long discussion of the virtues of the two alternatives we decided to attempt estimates on *both* definitions—taxable income and residents' income. Later experience has shown that the distinction, while very important for Northern Rhodesia, is less important for other territories.

We went on to Nyasaland, chiefly because of the existence of the valuable data contained in the survey of subsistence agriculture and of native incomes and consumption generally made by a team under the direction of Dr. B. S.

Platt. This related to the immediate pre-war period that we wished to study. The similarities between Nyasaland and Northern Rhodesia give opportunities also for checking some of our Northern Rhodesian estimates. Nyasaland presented, however, few completely new problems that we had not yet encountered.

The study of Jamaica was undertaken for two reasons. First, we wished to try the techniques of national income measurement on a country intermediate between the primitive conditions of the African territories and the advanced industrial communities, which were the only others of which we had experience. When Miss Deane began work on Jamaica, Dr. Benham's estimates for 1942 were not yet available, but at a later stage they provided interesting opportunities of checking and comparison. Second, we wished to discover, in attempting to make estimate for a series of years, whether or not it might be practicable to make an intensive study, based, if possible, on a population census, an ecological survey and a census of production, for a single year, and then to continue the series for subsequent years with the aid of such statistical material as would normally be collected in any territory.

The main difficulties of the estimates for Jamaica in 1938 arose, as in the other territories, from the paucity of data, and in particular from the lack of any population census later than 1921. Thus the margins of error for 1938 were larger than we should have liked, chiefly because we could not estimate with any precision the numbers occupied in many of the relevant occupations, a task made much more difficult by the prevalence of subsidiary occupations.

When we came to attempt estimates for the series of years 1929-38 the results were even more tentative. A large part of the margin of error sprang from our inability to establish a really firm starting-point, and that in turn was mainly due to the limitations of the 1938 data. The main lesson here was that unless the data for the base year are sufficiently full and reliable to permit estimates of a reasonably low margin of error, estimates which involve extrapolation with the aid of a few readily available statistical series do not allow conclusive inferences to be made from the individual figures.

Thus far I have been concerned solely with the success or failure of our experiment in relation to its originally conceived objective—the further application of the new techniques. But in the course of the work it was inevitable that the second objective should insensibly intrude—the practicability of national income estimates for colonial territories and the methods by which such estimates can most profitably be made.

What has the experiment shown in regard to this? First, I would say, it has shown that the threefold—income, output, expenditure—approach has even greater advantages for the measurement of colonial incomes than it has for that of more advanced countries. The main limit on such calculations for colonial territories is lack of data. One is constantly forced to guess, to improvise, to twist information collected for slightly different purposes to one's task. The threefold method ensures the greatest possible check on ones' somewhat uncertain first calculations and the effective and simultaneous use of all the possible data that are relevant to the problem. A single approach,

whether through incomes or through output or through expenditure, neglects opportunities for checking and leaves much of the relevant statistical information unused.

Second, I would say that the experiment has shown that estimates sufficiently accurate to be of very substantial interest and very substantial use for administrative purposes are capable of being made for many colonial territories for which such information does not yet exist. If elaborate long-term development plans for a territory are under consideration it is of the first importance to be able to measure their potential impact upon the economy during the period of construction and their potential effects upon the national income once they are completed. I believe that Miss Deane's experiment, together with the similar, but rather less elaborate, experiments of Professor Benham in the West Indies, have shown the possibilities of such work.

Third, I would say that the deficiencies of the statistics of the three territories (and indeed of almost all colonial territories) have become apparent. While it would obviously be unreasonable to suggest the collection of a vast mass of data of no value for administrative purposes, the deficiencies of which we were most conscious were in regard to things which are surely of great administrative importance. Regular crop estimates, for example, are virtually non-existent in Africa; yet estimates both of areas under particular crops and of yields of particular crops have long been available for India, and have been sufficiently accurate to be of use. The method of valuation of imports, again, based on value free-on-rail at place of despatch, that is common in Africa, is peculiarly inappropriate to almost any study of the territory's economic position. These are but two instances of deficiencies which might be removed, with great advantage not only to national income studies, but to efficient administration generally.

Fourth, I would say that the experiment has taught us certain things about the nature and difficulties of the task of making such national income estimates. In Chapter II Miss Deane has described the logical basis of the fundamental tables that have been used by her and which might with great advantage be used also in applying similar methods to other territories, for experience in many other fields of colonial administration has shown the value of statistical comparison. But though Miss Deane's path-making may do something in this way to simplify the task of those who may subsequently attempt to measure the incomes of other territories, I do not believe that it is possible to eliminate all the possible pitfalls. In each territory that we have tackled, there have arisen specific problems which could be solved only by going back to first principles. If, as I hope, Miss Deane has solved them, it is partly, I think, because she has had the advantage of being able to argue the issues with certain others on her Advisory Committee who have great experience in this field. Her text describes in fairly complete detail the processes of her work. And this, I think, is important, for national income measurement is one of those tasks (I suspect colonial administration of being among them) that is better learned by example than by precept. Yet even the example inevitably shows the finished stage. In the course of the work I suspect that

we were each of us more than once reminded of a sentence of Lord Keynes: "It is astonishing what foolish things one can temporarily believe if one thinks too long alone, particularly in economics (along with the other moral sciences), where it is often impossible to bring one's idea to a conclusive test either formal or experimental."

Thus if, as I hope, the exemplars that Miss Deane has here provided lead those in authority in other territories to attempt national income estimates, I would urge two things:

First, I do not myself believe the task is technically very much more difficult than many of the tasks of the analysis of a population census which have been so admirably performed by carefully selected members of the Civil Service both in colonial territories and in India, where the series of population censuses built up a great tradition and provided the main basis of our economic and sociological knowledge of India.

Second, however able and however accomplished the persons appointed to do the work, I feel certain that they would be immensely strengthened and fortified if either the territory itself or the Colonial Office were to appoint an Advisory Committee which might keep touch with their work, and be a *friendly and co-operative body of reference to whom the logical and statistical doubts might be referred as the work progressed.*

In conclusion, a word must be said about the margins of error of Miss Deane's work. I would draw attention to what she has written in her final chapter. It is her view that the margin of error of the estimates for Northern Rhodesia is not greater than 10%, in the sense that 'the investigator is satisfied that, if complete data for making the estimates become available, the improved estimates would not differ from the results already obtained with inadequate data by as much as 10% at the outside'. Her similar judgments of the margins of error are, in the cases of Nyasaland between 15% and 20%, and in the case of Jamaica in 1938 about 8%, rising to 12% to 20% in the ten-year series. Miss Deane has emphasised the uncertainty of these judgments of the margins of error, and her Advisory Committee would, I know, stress this uncertainty. The possible errors arise largely from the very grave limitations of statistical material, more particularly in regard to the subsistence economy, and are greatest where this is a very large part of the whole. They could be narrowed very appreciably by further enquiry, and were in some measure due to the difficulties of verification in London and in war-time. But if the margins of error are not excessive for the total national income, it cannot be too strongly emphasised that they are very large indeed for some of the individual components. For where the magnitude of a component was unknown, Miss Deane has, very rightly, made an estimate based on the best and most nearly relevant information. But this has meant that the figures given for many components are scarcely more than guesses. If the thing guessed is small, an error in the guess will not greatly affect the final total, and any sensible guess is better than mere omission; there is no reason to regard zero as a closer approximation to truth than a reasonable guess. But it would be most dangerous to take items guessed in



this way out of their context and to regard the figure that Miss Deane has put down as having greater authority than she would attach to it.

If the effect of Miss Deane's arduous labours, continued over nearly five years, is to stimulate the Colonial Office and Colonial Governments to undertake the task of making better and more authoritative estimates, she will feel herself well rewarded. Their estimates ought to be better. For war-time experience, both in the United Kingdom and in the United States, has shown the vast advantage of the official statistician, backed by all the resources of government, over the academic investigator, however fortunate in official help. But even such estimates as are now easily practicable are very well worth the making. Before we started, I do not think any of us could have guessed the income per head in any of these territories with any great confidence that the final outcome might not be twice as great or half as great. Compared with present ignorance an estimate with an error of 10% is accurate knowledge.

And to my mind an estimate of the national income is the necessary beginning of a serious economic study of any country. What would we know of the probable effects of the war on the United Kingdom if we possessed no national income estimate? What did we know of the economic state of India before investigators gave us reasonable estimates of income per head? What do we really know to-day about the standards of life of the millions in the Colonial Empire for whose welfare we are responsible?

Cambridge,  
*May, 1947.*

AUSTIN ROBINSON.

## AUTHOR'S PREFACE

IN the course of the following pages attention is frequently drawn to the highly experimental nature of the Enquiry, of which this is an interim report, and to the tentative way in which the estimates and conclusions are put forward. Nevertheless, for the benefit of readers who may be tempted to make use of the estimates without taking full account of their accompanying text, it is necessary to preface the report with an explanation and warning.

All the estimates made in the following pages were made in London and without first-hand knowledge of the territories to which they relate. They represent the results of an intensive study of official and other reports, strengthened occasionally by advice and suggestions from individuals with first-hand knowledge of the colonies. They are published here, not because they are regarded as final or even as satisfactory estimates, but because the lessons learned in the course of these first attempts to apply the official United Kingdom method of national income measurement to colonial territories may be of value to other investigators.

That there are no other estimates of a similarly comprehensive nature for the three colonies, and that any attempt to frame or criticise economic policy must depend in the last analysis on an assessment, however vague, of the economic factors which are experimentally measured here, was another reason for publication. It is in this connection, however, that a warning is chiefly needed. After a systematic analysis of the available information on the three economies, in all its aspects and implications, it is even more apparent that the basis for economic policy decisions is inadequate. By publishing such estimates as these some light may be thrown on the nature, structure, and distribution of the product of national economic activity, but, even when fully exploited, the basic information is still inadequate to support firm conclusions on economic conditions in detail.

By the time this is published the enquiry into the national income of Northern Rhodesia and Nyasaland will have entered into a second and more practical stage. The enquiry, having been tested on paper, is being carried into the field. These estimates of Northern Rhodesia's national income, although they are the second set of estimates,<sup>1</sup> are still not final, even as far as this enquiry is concerned. When the field studies on Northern Rhodesia and Nyasaland are complete there will be revised estimates for later years. Indeed, it is to be hoped that, as the science of national income measurement and appropriate statistical reporting methods improve in Central Africa, the estimates for each year will continually be revised and brought nearer accuracy.

In conclusion I should like to express my gratitude to those who initiated and guided the enquiry and to all those who helped in the search for suitable

<sup>1</sup> The first set have been published as an illustration to an article on colonial national income measurement in *Studies in Income and Wealth*, Vol. VIII, by the National Bureau of Economic Research, New York, 1946.

material and in the construction of reasonable estimates. Mr. James Meade, Mr. Austin Robinson, Mr. Richard Stone and Mrs. F. S. Stone formed the committee under whose inspiration I began the research. Throughout the enquiry the officials at the Colonial Office co-operated in every possible way. To many people, too numerous to mention individually, I owe thanks for their helpfulness in reading and criticising intermediate reports, and in advising on, or making accessible, valuable data.

I must, however, give special thanks to the advisory committee which was always at hand to advise and assist in the day-to-day problems of the research. Mr. Robinson, Mr. Stone, and, later, Mr. W. Arthur Lewis gave up innumerable lunch hours and evenings throughout the long course of the enquiry to reading the many draft reports, to discussing the methodological problems as they arose, and to eliminating, as far as they could in the limited time at their disposal, the inaccuracies and fallacies which appeared in each report. For the way in which this paper is presented, for the estimates which are constructed, and for the conclusions which have been drawn they can take no responsibility. For the pitfalls which have been avoided, and for the good results which have been achieved, only I can know how much the enquiry owes to their unfailing wisdom. My debt to them is infinite.

Finally, my very warm thanks are due to the staff of the National Institute. Mrs. F. S. Stone, the Secretary, was throughout an invaluable member of my advisory committee and also took charge of the administrative and publication problems of the enquiry. Mrs. M. Livermore and the secretarial staff of the National Institute typed the intermediate reports and prepared the final MS. for the press. Their willingness to work against time in difficult war-time conditions made possible the continuous co-operation with my committee and the final completion of the MS. before my departure.

In my absence the task of checking and correcting the proofs was undertaken by my committee and the staff of the National Institute. For the care and patience with which they undertook this tedious labour I am more grateful than I can say. I must, however, give a special word of thanks to Miss M. Potter, who checked all of the many tables in the paper: and I should like to say once again how much I have appreciated the continuous guidance of Mrs. Stone, to whom I owe thanks for assistance at every stage of my work on the enquiry.

Lusaka.

PHYLLIS DEANE

*May, 1946.*

# CONTENTS

CHAPTER	PAGE
FOREWORD BY E. A. G. ROBINSON, C.M.G.	v
AUTHOR'S PREFACE	xi
I INTRODUCTION TO THE EXPERIMENT	1
II THE LOGIC OF THE FUNDAMENTAL TABLES	7
III THE NATIONAL INCOME OF NORTHERN RHODESIA, 1938	21
Part I: The Income Column	25
Part II: The Output Column	33
Part III: The Expenditure Column and the Balance of Payments	53
Part IV: Conclusions	59
IV THE NATIONAL INCOME OF NYASALAND, 1938	68
Part I: Income	69
Part II: Output	73
Part III: The Expenditure Column and the Balance of Payments	81
Part IV: Conclusions	87
V THE NATIONAL INCOME OF JAMAICA, 1938	95
Part I: Income	96
Part II: Output	105
Part III: Expenditure	117
Part IV: The Balance of Payments	121
Part V: Cross-checking the Estimates	123
VI THE NATIONAL INCOME OF JAMAICA, 1929-38	128
VII CONCLUSIONS ON THE EXPERIMENT	142
APPENDIX I	
I PRELIMINARY ESTIMATES FOR NORTHERN RHODESIA	154
II BIBLIOGRAPHY	156
INDEX	163

## LIST OF TABLES

CHAPTER	PAGE
II THE LOGIC OF THE FUNDAMENTAL TABLES	
Table 1. The simplest case of the income-output-expenditure table	9
Table 2. The income-output-expenditure table, distinguishing government activity	10

CHAPTER		PAGE
	Table 3. The revenue and expenditure of government	11
	Table 4. The income-output-expenditure table, distinguishing government activity and national activity abroad	12
	Table 5. The balance of payments	13
	Table 6. The income-output-expenditure table for taxable national income	15
	Table 7. The balance of payments of the taxable nation	17
	Table 8. An income-output-expenditure table showing subsistence output	20
III	THE NATIONAL INCOME OF NORTHERN RHODESIA, 1938	
	Table 9. The earnings of European individuals	26
	Table 10. Company incomes	27
	Table 11. Earnings of African employees	29
	Table 12. Earnings of independent workers	30
	Table 13. Net national taxable income	32
	Table 14. Output of mining industry. First approximation	33
	Table 15. Mining industry account	34
	Table 16. Output of European agriculture. A first approximation	35
	Table 17. An account for European agriculture	36
	Table 18. Output of animal products. First approximation	37
	Table 19. The productive population for African agriculture	40
	Table 20. Output of African agriculture	41
	Table 21. Value of output of African agriculture. First approximation	42
	Table 22. Value of the output of African industry	45
	Table 23. Value of the output of secondary industries	45
	Table 24. An unbalanced account for the Zambesi Sawmills	46
	Table 25. Net output of forestry	46
	Table 26. Net output of distribution. First approximation	47
	Table 27. Distribution. A balanced account	48
	Table 28. Output of the Northern Rhodesian railway. First approximation	48
	Table 29. An account for the railways	49
	Table 30. Net output of motor, river and carrier transport	50
	Table 31. Miscellaneous services	51
	Table 32. National income and output. The second estimate	52
	Table 33. The taxable balance of payments	53
	Table 34. European consumption. First estimate	56
	Table 35. African expenditure. First estimate	57
	Table 36. Government revenue and expenditure	58
	Table 37. Income and output. After checking with expenditure estimates	61
	Table 38. Income, output and expenditure. The final cross-check. Taxable incomes	62
	Table 39. Income, output and expenditure. The final cross-check. Residents' incomes	63
	Table 40. The income-output-expenditure table. Final estimate. Taxable income, Northern Rhodesia, 1938	64
	Table 41. The income-output-expenditure table. Final estimate. Residents' income, Northern Rhodesia, 1938	66
	Table 42. The balance of payments. Final estimates. Northern Rhodesia, 1938	67

CHAPTER

PAGE

IV THE NATIONAL INCOME OF NYASALAND, 1938

Table 43.	Income distribution of individual Europeans	69
Table 44.	Incomes earned by individual Europeans in different industries	69
Table 45.	Incomes earned by companies	70
Table 46.	Incomes of Asiatics	70
Table 47.	Activities of adult male Africans	70
Table 48.	African wages earned in Nyasaland	71
Table 49.	Farmers' and fishermen's cash earnings	72
Table 50.	The taxable income of Nyasaland. A first approximation	73
Table 51.	Net output of European agriculture	74
Table 52.	Account for European agriculture	74
Table 53.	Output of native agriculture	76
Table 54.	Output of distribution	77
Table 55.	An account for European and Asiatic distribution	77
Table 56.	Output of transport	78
Table 57.	An account for transport	78
Table 58.	An account for the missions	79
Table 59.	An account for government	79
Table 60.	An account for the miscellaneous section of output	80
Table 61.	Net taxable output after checking with income estimates	81
Table 62.	Disposal of European income	82
Table 63.	European income and outlay	82
Table 64.	African agriculture after balancing output and expenditure	83
Table 65.	Cash expenditure of Africans	84
Table 66.	Income and outlay of Africans	84
Table 67.	Asiatic income and outlay	84
Table 68.	Revenue and expenditure of government	85
Table 69.	A companies' account	85
Table 70.	Income, output and expenditure, Nyasaland, 1938	89
Table 71.	Taxable income-output-expenditure table, Nyasaland, 1938	90-91
Table 72.	Balance of payments of the taxable nation, Nyasaland, 1938	92
Table 73.	Residents' income-output-expenditure table, Nyasaland, 1938	93
Table 74.	Balance of payments of the resident nation, Nyasaland, 1938	94

V THE NATIONAL INCOME OF JAMAICA, 1938

Table 75.	Occupations	97
Table 76.	Labourers' wages	99
Table 77.	Farming profits	101
Table 78.	Profits from trades and professions	101
Table 79.	Other wages and salaries	102
Table 80.	Assessed and unassessed incomes from all sources	103
Table 81.	Total taxable income. The first estimate	104
Table 82.	Value of output of bananas	107
Table 83.	Total value to producer of agricultural products	108
Table 84.	Output of livestock products	109
Table 85.	Value of net output of manufactures	110
Table 86.	Domestic service, hotels, entertainments	113
Table 87.	Professional services	114
Table 88.	Value of miscellaneous industries and services	115

CHAPTER	PAGE
Table 89. Total taxable output. The first estimate	116
Table 90. Personal consumption	118
Table 91. A combined revenue and expenditure account for the local and central authorities	120
Table 92. Total taxable expenditure. The first estimate	120
Table 93. Receipts from and expenditure abroad. The first estimate	122
Table 94. The balance of payments	123
Table 95. The national economy of Jamaica, 1938	124
Table 96. The income-output-expenditure table. The final estimate. Taxable income, 1938	125
Table 97. The income-output-expenditure table. The final estimate. Residents' income. National income of Jamaica, 1938	126
Table 98. The balance of payments. Final estimate. Residents' balance. Balance of international payments of Jamaica, 1938	127
 VI THE NATIONAL INCOME OF JAMAICA, 1929-38	
Table 99. Taxable income, output and expenditure. The first estimates for 1929-38	134
Table 100. Taxable income of Jamaica, 1929-38	137
Table 101. Taxable output of Jamaica, 1929-38	138
Table 102. Taxable expenditure of Jamaica, 1929-38	139
Table 103. Taxable balance of payments of Jamaica, 1929-38	140
Table 104. Jamaica, 1929-38. Miscellaneous series and indices	141
 VII CONCLUSIONS ON THE EXPERIMENT	
Table 105. Degree of dependence of the selected colonial economies	149
Table 106. Distribution of national income between different races	150
Table 107. The structure of net national output, 1938	151
 APPENDIX I	
 PRELIMINARY ESTIMATES FOR NORTHERN RHODESIA	
Table 108. The taxable income of Northern Rhodesia. Preliminary estimates compared with revised estimates	155

# CHAPTER I

## INTRODUCTION TO THE EXPERIMENT

The national income of a country can be briefly defined as the aggregate net value of the goods and services produced by its people during the year. The attempt to calculate national income is thus an attempt to embrace within a single measurable concept the whole of a country's productive activity. By so doing it is possible to obtain an index of the value of total economic activity and of total purchasing power. Changes in the size of the national income, for example, reflect a rise or fall in the community's production or in the value of its output. Changes in its content indicate structural changes in the national economy and reflect variations in the kind of economic activity involved or in the relative importance of different kinds of economic activity. It is information on these matters which forms the basis of attempts to forecast or trace the effects of economic policy. By means of the national income concept the relevant facts can be presented in a relatively precise and intelligible form.

Even more valuable as an aid to the formulation and interpretation of economic policy is the actual material of which a national income calculation is made. In calculating the aggregate value of all goods and services produced by the community in the course of a year, it is necessary to ascertain what each individual, or group of individuals, or each industry, contributes to the national total, or what share of the total each receives. A national income total is the sum of many parts. It is reached through the completion of a series of quantitative estimates, which together cover, however broadly, all branches of national economic activity. By assembling the estimates, and presenting them intelligibly in a coherent whole, it is possible to provide a clear, detailed picture of the national economy.

Official estimates of the United Kingdom national income began to be published during the war. In April, 1941, the Financial Secretary to the Treasury presented to Parliament the first of an annual series of command papers entitled *An Analysis of the Sources of War Finance and an Estimate of the National Income and Expenditure in 1938 and 1940*.<sup>1</sup> This publication, which appears with the Budget each year, makes it possible to see the government's own accounts in the framework of the national accounts, and to trace the effects of government expenditure throughout the national economy. Its primary object was to show how the government's war expenditure was financed by the diversion of resources from other ends, and how this diversion affected the distribution of the national product.<sup>2</sup> As was explained in the preface to the 1945 issue,<sup>3</sup> however, this method of analysis is not of war-time application only. Wherever the government

<sup>1</sup> Cmd. 6261, H.M.S.O., 1941.

<sup>2</sup> i.e. the net value of the nation's production of goods and services.

<sup>3</sup> Cmd. 6623, H.M.S.O., 1945, p. 2. This issue carries the estimates over the years 1938 to 1944 inclusive.



undertakes a substantial programme of expenditure it sets off a chain of significant repercussions throughout the economic system. Its expenditure plans can be responsibly formed, and intelligently interpreted, only in the light of an adequate knowledge of the structure of the national economy. This is true of a government which accepts as an aim of economic policy the maintenance of full employment. It is true, no less, of colonial governments which undertake the expenditure of large capital sums on development and welfare projects.

Methods of drawing up and presenting the national accounts vary for different types of economic system. Even within the same, or similar, economies, observers may differ in their opinion as to what is the most useful type of information to record, and on the most suggestive way of setting it out. Differences in the material of which the accounts are made, as well as in the purposes for which they are required, produce practical difficulties even when the definitions to be followed are clear.

In countries where production for exchange is the normal procedure, as is the case in all highly developed countries, it is conventional to exclude from the conception of economic activity, and hence from the national income, services produced by the individual for his own and his family's use. Thus Clark defined the national income<sup>1</sup> as including only those goods and services which are customarily exchanged for money. This conception, with various qualifications,<sup>2</sup> forms the basis of the national income calculations which are made for the United Kingdom, the United States, Sweden, and indeed for most of the countries for which estimates of national income are a familiar accompaniment to economic analysis. It is implied for the greater part of national income theory. It requires thorough reconsideration, however, in the light of conditions prevailing in undeveloped areas. In most of tropical Africa, for example, only a fraction of the people's working time is occupied by production for purposes of trade. Their standard of living depends primarily on subsistence output, that is on their production of goods and services for their own or their family's direct consumption. In effect, in studying economies which are at an early stage of development it is necessary to lay particular emphasis on activities of a kind that would be treated as exceptional, or relatively unimportant, in advanced countries.

This is only one obvious example of the way in which the national income concept is wedded to the economy for which it is evolved. As a result, the number of acceptable definitions of national income is legion, and it is rarely possible to draw clear comparisons between national income calculations made by different investigators, or investigators with a different economic background in view. Clearly, it would be of considerable advantage, when planning or assessing the economic policy of a given area, to be able to compare the volume, structure, and direction of its economic activity with

<sup>1</sup> Colin Clark, *National Income and Outlay*, 1937, p. 5.

<sup>2</sup> The rule admits of numerous exceptions. Some categories of untraded goods and services are included in all national income calculations. For a discussion of this point see Simon Kuznets' article on 'National Income' in the *Encyclopedia of the Social Sciences*, 1937, Vol. XI, pp. 208-9. See also Simon Kuznets' *National Income and Its Composition*, 1919-1938, Vol. I, pp. 50-54.

similar data for other countries. Moreover, since it is increasingly necessary to frame economic policy decisions in the light of the influence of policy and conditions in the rest of the world, or of the possible international repercussions of a particular decision, there is a real need for comparable standards of measurement and interpretation of economic activity. When the development and welfare of many countries is the ultimate responsibility of a single authority, as is the case for the Colonial Empire, the need for common standards is reinforced.

As a necessary step in the evolution of more or less uniform standards of national accounting procedure, the present enquiry was undertaken by the National Institute of Economic and Social Research. The method of national income measurement, which emerged from the construction of tables of income and expenditure for the United Kingdom, had produced what seemed a valuable instrument of economic analysis. Hence, the primary object of the enquiry on which this study is based was to discover whether the method could be applied, or adapted for application to, economies of a fundamentally different nature. The enquiry took the form of an attempt to measure, by this method, the national income of certain colonial territories, chosen mainly because they differed widely in economic characteristics from the United Kingdom. Both of the two Central African territories, for example, contain a high proportion of subsistence producers. In Northern Rhodesia these very primitive producers are in direct or indirect contact with a highly capitalised modern industry. The West Indian island of Jamaica exhibits the characteristics of a more advanced colonial economy, but still one in which the nature of, and incentives to, economic activity follow a very different pattern from that prevailing in the United Kingdom. Other factors influencing the selection were the immediate need for a clearer picture of the economies concerned and the availability of certain kinds of information.

It was with three principal objects in mind that the enquiry was undertaken. In the first place, it was intended as an experiment in national income measurement. There was only one way of discovering how adaptable to colonial conditions was the method used in compiling the United Kingdom estimates of national income. That was to put it into practice. If the enquiry achieved nothing else it would show whether there were any advantages in adapting the method for colonial national income measurement.

Secondly, if the method proved at all applicable it would involve the collection and systematic interpretation of all available information on economic conditions in the colonies selected for the period given. In none of these colonies had there been, at the beginning of the enquiry, any thorough attempt to approach the study of economic conditions from the point of view of national income. However unsatisfactory such estimates should prove, given the inadequacy of the statistics available for the purpose, the study should throw new light on the structure and problems of the colonies concerned.

Thirdly, it was hoped that the enquiry would throw into immediate relief the principal deficiencies in existing methods of collecting and compiling

economic statistics for each of the colonies studied. The use of national income tables as a basic tool of economic analysis is a comparatively new approach to policy problems, at least in respect of colonial economies. The construction of national income accounts on the lines adopted for the official United Kingdom estimates is a modern development in national income theory. One result of measuring the primitive techniques of fact collection which still exist in most colonies, against the demands of modern economic analysis, should be to provide both a target for the future development of colonial statistics and a means of assessing the extent, nature and relative significance of present inadequacies.

It is necessary to stress here that the experiment had serious limitations. The most important of these arose out of the fact that it was conducted far from the colonies themselves. At best the estimates were based on second-hand information. War-time conditions restricted to an absolute minimum the amount of data which could conveniently be obtained from observers on the spot. Difficulties of this kind dictated the period studied. It was primarily because 1938 was the last year for which the complete series of published data were available in London that it was taken as the base year in each case. This meant, however, that even where direct information could be obtained from the colonies concerned it was unlikely to refer precisely to the year under consideration.

In making the Northern Rhodesian estimates, an attempt was made to eliminate their major weaknesses by submitting the results to a number of first-hand observers both in England and in the colony. Their criticisms enabled the preliminary estimates, made in London, to be considerably strengthened. Nevertheless, for all three colonies, the results achieved were of a tentative nature. In no case was there the basis for a complete series of firm estimates. Several of the significant entries made in the tables for Northern Rhodesia and Nyasaland were the result of putting arbitrary quantitative interpretations on qualitative researches. Thus the tables of national income, output, expenditure, and international payments, which are reproduced in this paper, should be cautiously interpreted. The fact that the evidence available for a national income calculation was inadequate must constantly be borne in mind by anyone who desires to use them as a basis for the interpretation of policy decisions. This cannot be over-emphasised. It was one of the prime objects of this enquiry to find out precisely how the material was inadequate, in order to reveal, by practical demonstration, the obstacles which impede the making of reliable and useful estimates of national income for these and similar colonies. The results which are given here represent the early outcome of an experiment which is still in an exploratory stage. It is because the material on economic conditions in the colonies is so incomplete that it may be that the tables will be useful as an aid to the interpretation of policy and of actual development plans.

Wherever possible an attempt is made to assess the reliability of the estimates. The principles on which this has been done may be briefly indicated. It will be recognised that in this field of investigation it is not possible to compute standard errors by the usual statistical procedures since the informa-

tion comes, not from scientifically selected samples, but from a wide variety of different sources many of which are partial and incomplete. This being so, an attempt has been made to assess what are here called margins of error for each of the components of each national total. In assessing these margins of error, an attempt is made to express the investigator's belief about the accuracy of the material and methods and to put a percentage margin on either side of the estimate which indicates what is thought to be the limits of possible error. Limits in this sense must not be thought of as absolute limits but as points beyond which it would be very surprising if the truth lay. The limits given below are intended to accord roughly with the usual procedure of taking plus or minus three times the standard error as the limits between which the truth is almost certain to lie. It will be understood of course that the truth is not believed to lie anywhere within the limits of error with equal probability. The probability is highest at the value given by the estimate and diminishes as we get further and further away from this value. By the time we reach the point given by the margin of error, the probability has reached a very small figure indicating that it is most unlikely that the truth lies outside this limit. This process is necessarily a subjective one and must to some extent reflect the confidence of the investigator. The procedure, however, has the advantage of giving the reader some information about the investigator's own view of the results. The subjective bias due to the investigator's personality can be ignored in comparing the margins of error attached to different items throughout the investigation.

An attempt is made to reach margins of error for the national totals by combining in the first place the margins of error of their components. Here the usual procedures have been adopted, namely that where the errors in the components are believed to be independent, the margins of error have been combined by taking the square root of the sum of their squares. On the other hand where it is believed that the errors in two components are perfectly correlated, the margins of error have simply been added together. In other cases an intermediate figure has been taken.

The second stage in arriving at the margins of error in the totals is to form a weighted average, for example of the national income, output and expenditure, the weights normally being their individual margins of error. In this way a final figure is reached which in principle should be more accurate than any of the individual totals, and the margins of error of which will be related to the reliability of its constituent parts.

It cannot be over-emphasised that the process described above is difficult, uncertain and highly subjective. The reliabilities indicate the beliefs of the investigator and these beliefs must frequently be formed with comparatively little knowledge about the statistical nature of the data available. Thus in the ordinary case where the information is derived from a properly designed sample the investigator may be confident of the calculated reliabilities attached to his results, but in the present case it has been very difficult to say how far any particular material used is complete and also how far one's opinion could be changed by the existence of more information. On the evidence available a certain result may seem highly reliable though a single

piece of additional evidence might result in a major revaluation. There is always a considerable risk of allowing certain grave misconceptions to rule unchecked, simply because of the lack of sufficient detailed knowledge.

It is thought, however, that the procedures adopted are preferable to a bald statement of the numerical conclusions without any indication of the margins of error to which they are believed to be subject. It will be apparent that the accuracy of the estimates presented here, especially in the case of the component details, is usually much smaller than is to be expected for similar calculations made for the United Kingdom or the United States of America. At the same time the problems of assessing accuracy are similar in all cases since in no country are estimates of the national income built up from detailed material, the whole of which is of calculable reliability. This state of affairs will continue as long as it is not possible to base these estimates either on complete and reliable census data, or on scientifically designed sampling surveys which give rise to unbiased estimates of calculable reliability. It is desirable that the unsatisfactory nature of most economic data in this respect should be borne in mind.

The main solid achievement of the enquiry is that it has submitted a mass of hitherto undigested facts and figures on economic conditions in the relevant colonies to a modern technique of analysis and presentation. In so doing, it has defined in positive terms the obstacles in the way of applying an advanced system of national income measurement to relatively undeveloped areas, and has suggested methods of overcoming these obstacles. Final solutions to most of the problems raised must be sought in the colonies themselves, for they depend in each case on the economic framework, on the needs of the administrator, and on the potential improvements in the existing system of fact collection and analysis.

The next stage of the experiment will be to take up these problems within the colonies themselves. The tables which have emerged from this stage are first and foremost a basis for discussion. If they have a function in presenting a coherent picture of three colonial economies, it is because the existing sources of information are so ill-adapted to supply the needs of modern economic analysis. Even a crude attempt to combine and systematise the available data increases the sum of accessible information which could form a basis, however shaky, for economic policy decisions, and strengthens the argument for attempting a full-scale local calculation in each colony.

## CHAPTER II

### THE LOGIC OF THE FUNDAMENTAL TABLES

The method of constructing national income tables which forms the basis of the official United Kingdom estimates, provides a comprehensive picture of the national economy.<sup>1</sup> It measures the national income from three different points of view, each of which can be analysed into a different set of constituent items.

(a) First of all, national income can be regarded as the sum of the incomes obtained from economic activity by the country's inhabitants. A national income table constructed from this point of view records the distribution of income among the various kinds of income receivers in the form of rents, profits, interest, wages and salaries. It may also group incomes according to their size or according to the occupation, nationality and domicile of the earner. In the tables for Jamaica<sup>2</sup> an attempt is made to follow, so far as possible, the United Kingdom practice of dividing net national income into rents, profits, interest, wages and salaries, but each of these items is again subdivided according to the industry or occupation in which the income was earned. In the tables for Northern Rhodesia and Nyasaland<sup>3</sup> the main principle of classification was national and the incomes were divided into those earned by European individuals, European companies, Africans and Asiatics. These again were subdivided according to industry and occupation.

(b) Secondly, national income can be measured in terms of the nation's output of goods and services. This is net national output. It is arrived at by calculating the net value of each industry's output of goods and services. Since by net value is meant the total selling value of output, less the value of those goods and services which are purchased from other industries or from abroad and of depreciation,<sup>4</sup> this way of looking at national income shows it as the sum of each industry's particular contribution to the national total of goods and services. In effect, it involves grouping the nation's incomes, not according to the people who earn them, but according to the industries in which they are earned. Thus, although in practice net national income may be calculated from income tax returns, wage statistics, and similar data, and net national output can be constructed out of the kind of material collected for a census of production, the only difference ultimately is that the constituent items are differently classified.

(c) Finally, and in the third place, national income can be measured through the channels of its expenditure. When the people of a country receive their income they can do one of two things with it. They can use it

<sup>1</sup> The method is described in an article by J. E. Meade and Richard Stone in the *Economic Journal* of June-September 1941, entitled 'The Construction of Tables of National Income, Expenditure, Savings and Investment'.

<sup>2</sup> See p. 126-7 below.

<sup>3</sup> See p. 64-5 and 90-1 below.

<sup>4</sup> See below, p. 16, for a more detailed definition of 'net value of output'.

to satisfy their immediate needs, that is they can consume it, or they can postpone consumption by investing it.<sup>1</sup> Hence net national expenditure consists of the sum of two sets of activities concerned with the ultimate disposal of income. The first of these is the sum of the goods and services currently consumed in the country or bought for current consumption. The second includes all the ways of holding wealth which is not currently consumed, whether it is held in the form of stocks of consumable goods, or of capital equipment, or of foreign assets. In compiling an account of net national expenditure for the United Kingdom, for example, information would be sought among statistics of retail sales, financial and foreign trade transactions as well as in budget surveys.

These three aspects of national income form the basis of a triple entry balancing account. Every income generating activity is entered three times, once in each column, and from three distinct sets of basic data. The advantages of this method of national income measurement are threefold. Each of the three approaches, in so far as it is based on independent and distinct calculations, sets out the same national income although the data are differently derived and differently classified. Hence each of the three totals constitutes a check on the other. In addition, many of the constituent details can be separately checked with items and combinations of items derived from alternative approaches. The second advantage is that the table which emerges from the triple calculation presents in conveniently tabulated form most of the information in this field normally required for the formulation and interpretation of economic policy. The third is that the act of drawing up a triple entry account tends to reduce the obscurities of definition and dangers of double-counting which may arise when national income is calculated from one point of view only, and when a confusion of the three aspects may escape notice for some entries. The need for complete clarity of definition is particularly important if international or inter-colonial comparisons are ever to be attempted.

The first fundamental table of the method which forms the basis of this enquiry is thus an income-output-expenditure table. The second is a balance of international payments. The first provides a three-dimensional picture of the national economy. The second sets the national economy in its world context by recording its transactions with foreign countries. This second table is also a balancing account in which all the sales by nationals to foreigners are set against the sales by foreigners to nationals. The income side of the account records all receipts from abroad in terms of the value of the goods and services exported by nationals. The expenditure side records all payments abroad in terms of the value of the imports of goods and services or claims to goods and services acquired by nationals.

#### THE INCOME-OUTPUT-EXPENDITURE TABLE.

A simple illustration of the main fundamental table is given in Table 1. Its three columns show the three aspects of the national income.

<sup>1</sup> For the purposes of this paper saving and investment are by definition equal. They both represent postponement of consumption.

TABLE I. The simplest case of the income-output-expenditure table

I	II	III
Net national income	Net national output	Net national expenditure
1. Rents	7. Net output of agriculture	14. Expenditure on goods and services for current consumption
2. Profits	8. Net output of mining	15. Net investment
3. Interest	9. Net output of manufacture	
4. Salaries	10. Net output of distribution	
5. Wages	11. Net output of transport	
	12. Net output of other services	
6. Total net national income	13. Total net national output	16. Total net national expenditure

It should be noted that each item is rendered net. This has a double significance. First, it means that in each of the three calculations allowance must be made for any reduction in the value of the capital equipment (land, machinery, buildings, stock, etc.), which occurs during the year. Profits are thus calculated after deducting costs of depreciation or renewal of equipment. Each industry's output is evaluated exclusive of current depreciation, or replacement costs. Net saving is found by deducting the value of depreciation or renewals incurred during the year and chargeable to current output, and by deducting also the value of the expenditure financed by borrowing or otherwise realising capital.

Secondly, in order to calculate net national income, net national output and net national expenditure in such a way that they together form a balancing account, it is necessary to avoid counting any part of the national product more than once in each column. The value of every income received, of every good or service produced and of every good or service consumed, or every addition to the national stock of capital, is entered once only in the relevant column. This means, for example, that transfer incomes (that is, incomes which are not received in exchange for a good or service) such as gifts or thefts are excluded from the income column. It means also that the value of raw materials and purchased services which enter into the costs of production of a given industry must be excluded in measuring the value of its net output, since they will appear elsewhere in the same column under their appropriate industry headings. The value of the groundnuts used in a groundnut oil factory should be excluded from the value of the manufactured oil, when it is part of the output of agriculture. Alternatively, if an individual lends his money to another person or institution to spend or hold for him—to a bank, for example—care must be taken to count this as one piece of expenditure only.

Theoretically, Table I is complete in that all varieties of income, output, or expenditure attributable to nationals can be duly entered under one or other of its headings. For most practical purposes, however, it is over-simplified. In particular, it hides the influence of both the government and the rest of the world in the national economy. There are thus two complications which should be introduced into Table I if it is adequately to reflect the structure of the economy.



## THE PART OF GOVERNMENT IN THE ECONOMY

The first of these complications is due to the presence of the government as a significantly independent institution in the economy. In Table 1 its net contribution to the total output of goods and services is nowhere summed as a separate total. Its expenditure is not distinguished from among the various categories of expenditure.

The importance and usefulness of estimates which illustrate the full nature and weight of government activity in the national economy do not require emphasis. Moreover, the fact that for most colonies the official financial reports render the activities of central and local authorities the best documented section of the national economy, gives an additional reason for subjecting them to distinct and detailed treatment.

Table 2 below re-arranges the material of Table 1 to give a version of the income-output-expenditure table which emphasises the main features of the government's special contribution to national economic activity.

TABLE 2. The income-output-expenditure table, distinguishing government activity

I Net national income		II Net national output		III Net national expenditure	
1. Rents		7. Net output of agriculture		15. Personal consumption	
2. Profits		8. Net output of mining		at market prices	
3. Interest		9. Net output of manufacture		16. Government subsidies	
4. Salaries		10. Net output of distribution		17. Less indirect taxes	
5. Wages		11. Net output of transport		18. Government current	
		12. Net output of government		expenditure on goods	
		services		and services	
		13. Net output of other services		19. Net investment	
6. Total net national income		14. Total net national output		20. Total net national ex-	
				penditure	

The output of government as of any other institution in the economy consists of the sum of the rents, profits, interest, salaries and wages earned in the course of its activities. Thus in the first column of the income-output-expenditure table the rent of government property is entered under item 1, the profits of government trading services under item 2, the interest on government investments under item 3, and the earnings of government employees under item 4 and 5. The sum of these items has been entered as a separate total—item 12—in the second column of Table 2. So far as the first two columns are concerned, therefore, no peculiar problems are raised by recognising the existence of the government.

The decision to distinguish government expenditure on current consumption—that is to divide item 14 of Table 1 into personal consumption expenditure and government expenditure on goods and services for current consumption—involves more specialised treatment, however. The difficulties arise because the government is neither the ultimate consumer nor the ultimate producer of all the income it spends. In some senses it can be regarded as an agent for its taxpayers. Table 3 below shows the various categories of government revenue and expenditure in a form designed to illustrate the government's part in the expenditure of the national income.

TABLE 3. The revenue and expenditure of government

Revenue	Expenditure
1. Direct taxes, fines, etc.	5. Transfer payments to the private sector of the economy
2. Indirect taxes	6. Subsidies
3. Income from property and profits from trading services	7. Net current expenditure on goods and services
	8. Capital expenditure
	9. Budget surplus
4. Total revenue	10. Total expenditure

Three features of this table require special comment. First of all, it is not a table which relates to central government activity only. It is a combined account for all government agencies and authorities, both central and local. Secondly, the distinction between direct and indirect taxes depends on whether or not the taxes influence relative prices. Direct taxes can be defined as those taxes which are charged after income has been distributed, and hence do not form an element in final price. Indirect taxes, on the other hand, are charged on the goods themselves and have a direct influence on the final sales price. Thirdly, item 9 is a balancing item which represents the amount by which government total net revenue exceeds total net expenditure on items 5, 6, 7 and 8. If part of this expenditure were financed by net borrowing, the balancing item would appear on the revenue side as a budget deficit.

Table 3 shows how the government obtains the funds which it spends, and on what type of expenditure it uses them. In spending item 3 it is disposing of income which has come to it directly in its capacity as producer. No double counting problems arise in entering this part of national current expenditure. As spender of the direct taxes the government is spending income which has been transferred to it by the producer. This again can be entered without difficulty, since it is a recognisable item in the budget of the private sector of the economy and can be excluded therefrom. In spending indirect taxes, item 2, however, the government is disbursing sums which have already been included in the purchase price of privately bought goods and services. In estimating total private expenditure at market prices on food, for example, the import duties charged on food are included as part of private expenditure. Thus duplication would be involved if the expenditure by public authorities out of indirect taxation were included as well as the amount of this taxation in the market prices of goods and services. For this reason, indirect taxes should be deducted from the value of the goods and services in respect of which they are paid. The converse is true of subsidies.

Thus in Table 2 government expenditure on goods and services for current consumption, and government expenditure on subsidies, can be included as separate items in the expenditure column, provided that item 17 deducting indirect taxes is also included. Indeed, if we can assume that both indirect taxes and subsidies fall on the goods and services included in item 15 (as for the most part they will), we have in the sum of items 15, 16 and 17 the true cost to the community of the goods and services consumed directly by the private sector of the economy.

## PRODUCTION AND EXPENDITURE ABROAD BY NATIONALS.

The second complication which can usefully be introduced into the income-output-expenditure table, is recognition of the fact that not all the national income is produced within the geographical borders of the nation. Emigrant labourers, business men who operate industrial concerns in other countries, owners of land or capital abroad, are the recipients of wages, profits, interest and rent which, being the income of nationals, is part of national income. It is useful to be able to distinguish income received for services of this kind from the output of goods and services produced within the national borders. In Table 4, therefore, the homeward remittances of migrant labourers and the profits, interest and rent received from sources abroad are included as a separate item in the output column. They are rendered net by deducting the income received by foreigners from their activities and property within the national borders.

TABLE 4. The income-output-expenditure table, distinguishing government activity and national activity abroad

I Net national income		II Net national output		III Net national expenditure	
1 Rents		7 Net output of agriculture		16 Personal consumption	
2 Profits		8 Net output of mining		at market prices	
3 Interest		9 Net output of manufacture		17 Government subsidies	
4 Salaries		10 Net output of distribution		18 Less indirect taxes	
5 Wages		11 Net output of transport		19 Government current expenditure on goods and services	
		12 Net output of government		20 Expenditure abroad by residents	
		13 Net output of other services		21 Net home investment	
		14 Net income from abroad		22 Net foreign investment	
6 Total net national income		15 Total net national output		23 Total net national expenditure	

The third column of Table 4 distinguishes two new elements, items 20 and 22. Item 20 includes the expenditure abroad of residents. European residents of tropical colonies maintain families and other commitments in the mother country, and also spend their leave and pension pay there. These payments include outlay on both current consumption and investment items, but even if it were possible to distinguish consumption and investment, it is a distinction of no great interest to the colonial territory in which the incomes are earned. They are therefore included as a separate lump sum in column III, together with the remittances abroad of immigrant traders or labourers to families abroad.

Item 22, called 'net foreign investment', is also separately entered in Table 4.<sup>1</sup> Lending abroad (rendered net by the deduction of borrowing abroad) can usefully be distinguished from home investment, both because it takes readily distinguishable forms, and because it represents a significantly different way of disposing of savings. The decision to record separately the net annual increase in national assets held abroad, is a corollary of the decision to distinguish national income derived from assets abroad.

<sup>1</sup> Item 22 must be rendered net of investment items already entered in item 20.

## THE BALANCE OF PAYMENTS.

The fact of foreign trade, however, is sufficiently important to the national economy to require separate and detailed interpretation. It is thus the subject of a second fundamental balancing table, which forms a supplement to the income-output-expenditure table. This supplementary table reveals some new details of national economic activity and interprets them from a fresh point of view. The balance of payments is designed to record, on the one hand, the value of the different kinds of national output which result in payments by foreigners to nationals, and, on the other hand, the value of the different forms of national expenditure which involve payments by nationals to foreigners.

The basis of such a calculation is the Customs Department's annual record of exports and imports of merchandise. To these recorded sales must be added all transactions which escape the official record. The 'invisible items', as they are called, include goods and services bought by tourists or travellers. They include services such as transport or financial services, the international trade of railway, or shipping, or insurance companies, for example. They include also the net remittances of emigrant labour, or the income on land, capital, or other properties, held abroad. Finally, to all these current transactions, it is necessary to add the nation's increase in assets held abroad, balanced by the value of national assets acquired by foreigners. This is equivalent to its net foreign investment or lending. Table 5 shows the principal items on each side of the balance of payments.

TABLE 5. The balance of payments

Receipts from abroad	Current expenditure and investment abroad
1. Value of domestic exports	9. Value of retained imports
2. Value of exported services	10. Value of imported services
3. Receipts from foreign missions	11. Remittances abroad by immigrants
4. Expenditure of foreign tourists	12. Foreign investment
5. Net income from foreign property	(a) Net increase in holding of gold
6. Net remittances from migrant labour	(b) Net increase in holding of foreign money or securities and other property or claims abroad
7. Net government receipts from abroad	
8. Total receipts from abroad	13. Total current expenditure and investment abroad

The left-hand column of Table 5 records the expenditure of foreigners on the output of nationals. The right-hand column records the payments of nationals to foreigners. As in the income-output-expenditure table, that part of income spent abroad which is not spent on current consumption abroad is treated as saving, and is entered under the heading of foreign investment. Conversely, if more is spent on current consumption abroad than is received from abroad, the difference is borrowed, and entered as negative foreign investment (or as foreign disinvestment). In effect, item 12 of Table 5 can be either positive or negative. It is, in part at least, a residual item. If, having entered all current items on both sides of the account, and having estimated the value of 12 (a) and 12 (b) from such official and unofficial financial accounts as exist, the sum of the items on income account exceeds the sum of the items on expenditure account, then the residue is foreign

investment, provided all the other items have been entered correctly. The residue is, therefore, entered under item 12 (*b*). If the balance is on the other side and the sum of the items on income account is less than the sum of the items on expenditure account, then the deficiency must be entered negatively under 12 (*b*), on the assumption that some of the expenditure has been financed by borrowing abroad.

#### SOME PROBLEMS OF DEFINITION.

The definition of national income with which this enquiry started is one of very general application. It described national income as equal to the value of the goods and services produced during the year by the individuals who constitute the nation. So far, in explaining the general logic of tables of national income, output, and expenditure, we have not attempted to reduce this definition to more concrete terms. For practical purposes, however, it is necessary to be able to establish precisely which individuals constitute the nation, and which of all the goods and services they produce should be included in a national income calculation.

These are not problems which can be disposed of on general principles. They bear a very special relation to the particular needs and circumstances of each country considered. In effect, they raise two practical issues. Whose activities are the subject of national economic policy and what kind of activities are economic activities?

#### DEFINING THE NATION.

The nation which forms the basis of the official United Kingdom calculations of national income and expenditure can be defined as that group of individuals which is legally resident in the United Kingdom. The advantage of this approach is its simplicity. An income-output-expenditure table constructed on this definition relates to a definite recognisable group of individuals. It measures a national income which is both received and spent by persons living in the country considered. It can be interpreted in terms of average income per head by the simple expedient of dividing the total by the population of the country. It shows at once the total productive activity of the country's inhabitants and their total purchasing power. If national income comparisons are ever attempted on an international (or inter-imperial) scale, this is the most useful definition since it involves the smallest degree of overlap with the economic activity of other nations.

In an economy which depends largely on its own inhabitants to supply the skills and capital necessary in the production of goods and services within its borders, the total income received by its inhabitants is roughly equal to the total output produced in its territory. In most colonies, however, the profits and interest earned by 'foreign'<sup>1</sup> firms operating in the territory, or by foreign shareholders who have invested therein, amount to a significant sum. That is to say, there is a considerable flow of money abroad, which

<sup>1</sup> The word 'foreign' here is used in contradistinction to the word 'national'. It means non-resident.

is similar in character to the flow of money from abroad entered under item 14 of Table 4. When considering the total productivity of the area within its control, and, in particular, when assessing incomes for tax purposes, the government is interested in the gross total which includes this item of income flowing abroad, and not merely in the incomes earned by residents.

There are thus two groups which the government might wish to consider for national income purposes—the resident nation and the taxable nation. The output of residents is an index of the economic activity of the country's population. The output of the taxable nation is an index of the level of economic activity achieved within the country's borders. Where the owners of land, labour and capital used in producing the total output of the area are all, or nearly all, residents, the two nations are almost identical and no distinction need be made for most practical purposes. Where the returns accruing to foreign property and skills are considerable it will be necessary to calculate two national incomes—one a net national income comprising only the goods and services produced by residents, and the other a net taxable income, which includes, in addition, the value of foreign economic activity in the country.

The decision to consider two definitions of national income does not involve any alteration in the structure of the income-output-expenditure table, except in one respect. Since foreign property-holders, for example, are not resident in the country, their expenditure<sup>1</sup> in their own or other countries cannot be estimated together with the expenditure of residents, and is logically distinct from it. Hence in Table 6, below, an additional item has been entered into the income-output-expenditure table. This additional item gathers together all the incomes accruing to foreign earners<sup>2</sup> without distinguishing the ultimate channels of expenditure.

TABLE 6. The income-output-expenditure table for taxable national income

I Net national income	II Net national output	III Net national expenditure
1. Rents 2. Profits 3. Interest 4. Salaries 5. Wages	7. Net output of agriculture 8. Net output of mining 9. Net output of manufacture 10. Net output of distribution 11. Net output of transport 12. Net output of government 13. Net output of other services 14. Net income from abroad	16. Personal consumption at market prices 17. Government subsidies 18. Less indirect taxes 19. Government current ex- penditure on goods and services 20. Expenditure abroad by residents 21. Net home investment 22. Net foreign investment 23. Remittances abroad to non-resident earners
6. Total net national taxable income	15. Total net national taxable output	24. Total net national taxable expenditure

<sup>1</sup> This expenditure represents the uses to which dividends, interest, rents and salaries received by non-resident individuals and the undistributed profits accruing to non-resident companies are put. See also item 13, of Table 7, below, p. 17.

<sup>2</sup> The remittances abroad of immigrant native labourers should theoretically be included in this item but in practice it seemed more convenient to cancel them out against the inward flow from emigrant labourers and to include a net inflow in items 5 and 14 and a net outflow in item 20.

Structurally, there is no difference between columns I and II, constructed according to the 'national income of residents' definition (Table 4, for example), and the same columns constructed according to the 'taxable national income' definition, for which Table 6 has been adjusted by the addition of item 23. In content, however, the individual entries might vary greatly according to the definition adopted. The total extent of the variation would depend on the size of item 23. The nature of the variation would depend on the kind of activity by non-residents which gives rise to item 23.<sup>1</sup>

If item 23 is complex, it may be easier in practice to include the income and output of non-residents than to exclude it. In order to exclude it, it is necessary to distinguish income or output which, being earned in the country and in co-operation with residents, is usually estimated as part of total local activity. Thus, for the narrower definition, the entries made in column I should exclude any income not earned by residents, and column II should exclude all output not attributable to residents. It is the adjustment of column II which presents most complications, since it involves revaluing the actual net output of goods and services so as to exclude the contribution of non-residents.

The final value of the output of any industry, firm, commodity or service can be broken down into the following constituent items:

*Value of gross output*

1. Rent
2. Profits
3. Interest
4. Salaries
5. Wages
6. Materials and services purchased from
  - (a) Nationals
  - (b) Foreigners
7. Current costs of depreciation, maintenance, obsolescence, etc.

To arrive at the value of net output of any industry, it is simply necessary to deduct items 6 and 7, and the remainder is the industry's net contribution to total output. So we have:

*Value of net output*

1. Rent
2. Profits
3. Interest
4. Salaries
5. Wages

If, however, it is the industry's net contribution to the total output of residents that is required, it is necessary to see that no part of net output is due to non-residents. In the case of goods produced by a firm registered

<sup>1</sup> See Tables 41, 73 and 97 below.

abroad, for example, which owns all the land and capital necessary for its productive operations in the territory, but which employs local labour, it will be necessary to deduct the whole of items 1 to 3, and that part of items 4 and 5 which is paid to non-resident employees, say, in head office expenses.<sup>1</sup> If the firm is locally owned and operated, but borrows its capital from abroad, it will be necessary to deduct only item 3 from the value of net output.

Hence, when column I measures the national income of residents only, it excludes from each of the relevant categories of rent, profit, interest, salaries and wages the incomes which accrue to non-residents. When it measures national taxable income it includes these incomes. In the same way, when column II measures the national output of residents, it excludes from the net output of each industry that part of the rent, profits, interest, salaries and wages earned therein which accrue to non-residents. When it measures national taxable income it includes them. In each case, the sum of the items excluded to give the narrower definition is equal to the value of item 23 in column III.

The changes necessary to adjust the balance of payments so that it conforms to the wider definition of the nation are analogous. To include the income of foreign earners and so to measure taxable income calls for the addition to Table 5 of two new items. The first of these, which is equivalent to item 23 of Table 6, records the remittances abroad in respect of non-resident earners. These are the incomes which are earned by foreigners from operations within the country, and which are distributed, or held, abroad. The second records, as a deduction from total taxable expenditure abroad, those remittances from abroad by non-resident earners which are met out of balances, or by other forms of disinvestment or borrowing. These are foreigners' remittances from abroad which are financed by borrowing abroad. They could be entered positively on the receipts side of the account (instead of negatively on the payments side of the account), as investment in the country by foreigners.<sup>2</sup>

TABLE 7. The balance of payments of the taxable nation

Receipts from abroad	Current expenditure and investment abroad
1. Value of domestic exports	9. Value of retained imports
2. Value of exported services	10. Value of imported services
3. Receipts from foreign missions	11. Expenditure abroad by immigrants
4. Expenditure of foreign tourists	12. Foreign investment of residents
5. Net income from foreign property	(a) Net increase in holding of gold
6. Net remittances from migrant labour	(b) Net increase in holding of foreign money
7. Net government receipts from abroad	(c) Net increase in holding of foreign securities and other property abroad
	13. Remittances abroad to non-resident earners
	14. Disinvestment abroad by non-resident earners
8. Total receipts from abroad	15. Total taxable current expenditure and investment abroad

<sup>1</sup> See below, p. 33. This is what was done in the case of the Northern Rhodesian copper companies.

<sup>2</sup> As was done in the actual examples worked out in the following chapters. See, for example, Table 42, item 7.



Here again, although the structural difference required by the change of definition is slight, the content of the individual items may vary substantially if items 13 and 14 are large.<sup>1</sup> The two definitions involve quite different conceptions of what constitutes an export or an import. In general terms, a domestic export is the output of a national sold to a foreigner; a retained import is the output of a foreigner bought by a national. If the term national income includes residents only, those goods which are produced in the territory by foreigners and subsequently exported cannot be regarded as 'domestic exports' for the purpose of the balance of payments. In so far, however, as nationals have helped to produce these goods (by selling their labour to foreign firms, for example), their contribution does constitute an export and must be recorded. Similarly, if a foreign firm buys goods from abroad and brings them into the country these are not 'retained imports', except in so far as they are ultimately sold to nationals. If foreigners' purchases enter into the value of goods which are ultimately exported they are, in effect 're-exports', and should accordingly be excluded from imports.

In practice, this means that the goods which appear in the official export and import lists must be carefully scrutinised before being entered into the balance of payments, so that any element of foreign receipts can be excluded from the income account, and any element of foreign expenditure from the outlay account. The values given in the official export records are gross output values which could be analysed into the seven constituent items shown on page 16. If the commodity concerned is produced by nationally owned and nationally operated firms, it is simply necessary to deduct item 6 (*b*) from its recorded value, in order to arrive at its domestic export value for the purpose of the balance of payments. If, on the other hand, it is owned and operated by non-residents, and non-residents are not regarded as part of the nation under consideration, then items 1 to 3, item 6, and that part of items 4 and 7 which represents payment to non-resident employees, must all be deducted. This leaves all the value of salaries and wages paid to residents, and of materials and services bought from residents. When all firms operating on the territory are included as part of the nation then they are all 'nationally owned and nationally operated' and the only deduction to be made is item 6 (*b*).

Similarly, if a foreign firm buys goods from abroad and brings them into the country to assist its operation therein, these are not 'retained imports' for the purposes of the balance of payments of residents. In so far as they enter into the value of goods and services ultimately sold to or retained by foreigners, they should be treated as 're-exports' and deducted from the import list.

In sum, therefore, the differences between the balance of payments of residents and the taxable balance of payments are as follows:

- (1) The former excludes from the officially recorded value of exports the proportion that is received by non-residents. The latter includes it.
- (2) The former excludes from the officially recorded value of imports

<sup>1</sup> As in Northern Rhodesia. See below, p. 33.

the proportion that is bought by foreigners and not ultimately re-sold to nationals, while the latter includes it.

(3) The latter includes on the expenditure side of the account a sum equal to the incomes earned in the territory by non-residents and transferred abroad either to be distributed as dividends, interest, salaries and other forms of personal income, or to be added to foreign held balances and other investments.

(4) The latter treats non-residents' expenditure for purposes connected with the territory made out of savings or other capital held abroad as foreign disinvestment, and so deducts it from the expenditure side of the account. For the narrower definition of the nation this expenditure out of capital<sup>1</sup> by non-residents is ignored, except in so far as it is paid to residents, in which case it appears as an export of services under item 2.

#### DEFINING ECONOMIC ACTIVITY.

For an economy where production for exchange is the rule, it is possible to distinguish economic activity without much difficulty. Generally speaking, only those goods and services which enter into the course of trade are included in a national income calculation. Variations on this general rule, allowing for the inclusion of certain kinds of traded output evaluated at the prevailing price for traded output, can be adopted according to the needs and objects of the persons for whom the calculation is made. Very few investigators, for example, include the unpaid domestic services performed by housewives,<sup>2</sup> although most would impute a rent to houses occupied by their owners and include that in national income.<sup>3</sup> Decisions on such problems as whether or not to include in agricultural output the produce of allotments or house plots would usually make very little difference to the final result, and can be taken with a view to the specific needs and circumstances of a given country and a given time.

In a colonial economy, however, decisions on whether or not to include certain types of untraded output or unpaid labour may affect, not a relatively small part of total activity, but a very significant proportion. Where a large section of the total output of foodstuffs, for example, is produced for family consumption, and so never enters into the market, it is not possible to approach national income as if it were primarily a record of the goods and services which enter into the course of trade. Where most of the work of the agricultural industry is performed by unpaid female labour, the distinction between paid domestic labour and unpaid domestic labour is at once more arbitrary and less reasonable.

<sup>1</sup> This kind of expenditure is usually referred to in company accounts as 'capital expenditure' to distinguish it from expenditure appearing in the ordinary profit and loss account.

<sup>2</sup> Estimates made for Sweden by Professor Lindahl (quoted in Bowley, *Studies in the National Income* p. 11) give some indication of the potential magnitude of this item. There, by including unpaid domestic labour at the price given for paid domestic labour he obtained an increase in the national income amounting to about 25% for the years 1921-25 and about 20% in the years 1926-30.

<sup>3</sup> This follows a precedent set by the income tax authorities, most of whom assess the unpaid rent of owner-occupied houses as part of individual income.

Moreover, the income-output-expenditure table, with its three independently constructed columns, is based on the assumption that money incomes exist. Column I records the various kinds of money incomes received by nationals. Column II records the value of goods and services produced by nationals in the industries in which they were engaged. In an economy where goods and services are produced by each individual for his own or his family's enjoyment and no exchange takes place, i.e. in a subsistence economy, column I is inseparable from column II. For both columns the problem of measuring income is simply that of calculating the value of the goods and services produced. For output produced on a subsistence basis, there are no corresponding money incomes to be entered in column I. To complete the table it is necessary to enter the value of subsistence output in the same form as it appears in column II. Table 8, below, shows an income-output-expenditure table for a country with a substantial proportion of subsistence output. Items 6 and 15 in this table are equal and each equals the sum of items 18 (b) and 23 (b).

TABLE 8. An income-output-expenditure table showing subsistence output

I	II	III
Net national income	Net national output	Net national expenditure
1. Rents	8. Net output of agriculture	18. Personal consumption at market prices
2. Profits	9. Net output of mining	(a) Traded goods and services
3. Interest	10. Net output of manufacture	(b) Untraded goods and services
4. Salaries	11. Net output of distribution	19. Government subsidies
5. Wages	12. Net output of transport	20. Less indirect taxes
6. Net subsistence income	13. Net output of government	21. Government current expenditure on goods and services
	14. Net output of other services	22. Expenditure abroad by residents
	15. Net subsistence output for all industries	23. Net home investment
	16. Net income from abroad	(a) In traded goods
		(b) In untraded goods
		24. Net foreign investment
7. Total net national income	17. Total net national output	25. Total net national expenditure

Some decision will have to be made, however, on what constitutes subsistence output for the purposes of a national income table. Which of the activities of African women, for instance, in cultivating the soil, in grinding the corn, in cooking and otherwise preparing the food, in collecting firewood or wild foods, and so on, should be included as part of economic activities to be measured, and which should be classed as 'uneconomic' activities for national income purposes? No hard and fast rules can be laid down on these problems. Decisions will have to conform to the needs and circumstances of the country concerned. Practical considerations, dominated by the type of material available, determine the answers to many questions of this kind. For example, in making the Central African estimates it was found impossible to evaluate the time taken in rural districts to collect firewood and to cook food. By evaluating grain as meal, however, it was possible to include a

value for the services performed in grinding it.<sup>1</sup> This type of problem was dealt with for each colony as it arose on an *ad hoc* basis. Even if it were possible to take ultimate decisions on such questions without further study of the social and economic background of the colonies concerned, the scantiness of the material made it impossible to carry out such decisions.

### CHAPTER III

## THE NATIONAL INCOME OF NORTHERN RHODESIA—1938

The first experiment was the calculation of the national income of Northern Rhodesia for 1938. This was undertaken in two stages. The initial stage consisted in constructing a set of preliminary estimates on the basis of the material which was available in London. These preliminary estimates were then submitted for comment and criticism to a few informed observers, both in England and in Northern Rhodesia. The second stage involved the revision of the preliminary estimates, on the basis of the criticisms and of the data received since the compilation of the first set of estimates.

The present study gives the results of the second stage of the enquiry. It thus embodies the corrections emerging from the comments and criticism which the preliminary estimates provoked, and from the new data which came to hand since the first stage of the experiment was completed. While these corrections did not eliminate the constant recourse to guesswork, which was a feature of the enquiry, they did reduce the arbitrariness of the innumerable unchecked assumptions which had to be made, and they did eliminate a number of the avoidable blunders which arose from a lack of first-hand knowledge of the territory. For those who are interested, the results of the first stage of the enquiry are given in Appendix I, with a note on the nature of the more important changes that were made.

Two main groups of problems emerged at once from the Northern Rhodesian experiment. The first group arose out of the fact that this was a dependent economy, and the second out of the existence of a large number of subsistence producers. In addition, there were many minor differences between the colonial economy and the United Kingdom economy for which this technique of national income measurement was evolved. The minor differences produced their own problems of definition.

The fact that Northern Rhodesia is a dependent economy, meant that the line between the foreigner and the national is difficult to draw. The owners of the most valuable factors of production in Northern Rhodesia—more especially the owners of the capital sunk in the mining industry—were persons who were in no sense residents of the colony, although in their

<sup>1</sup> See below, pp. 59-60 and pp. 86-7, for a discussion of these problems in relation to the Northern Rhodesian and Nyasaland economies.

corporate capacity they carried on important economic activities there. The income accruing to the foreign owners of capital is part of Northern Rhodesia's income, at least for taxation purposes, and is sufficiently large to create a serious problem for the national income investigator. On the one hand, it would be unreal to rule this kind of activity out of the calculation altogether, as could be done for an advanced economy where the income accruing to foreigners probably does not vary significantly in total amount from the income accruing to residents on account of their activities abroad. On the other hand, when it is included in the total to be measured, the result is an income which relates not simply to the activities of the people of Northern Rhodesia, but also to those of a large and indefinite group of persons with no political identity. If the calculation is intended to throw some light on the standard of living enjoyed in Northern Rhodesia, or on the purchasing power at the disposal of its people, it is inappropriate to include the income of non-residents. If the calculation is intended to reveal the total yield of Northern Rhodesia's physical resources, or the value of the economic activity carried on within this political area, it is essential to include the activities of non-residents.

Because both interpretations of Northern Rhodesia's economic activity were important and both calculations were regarded as necessary to the formation of policy, two sets of national income tables were constructed. Tables 39 and 41 relate to what has been called in this paper 'net national income' and include only the income of persons actually resident in the colony.<sup>1</sup> It is this set of tables which must be considered if international comparisons or accumulations are attempted. They are constructed on the same definition of the nation as is used for the official United Kingdom calculations.<sup>2</sup>

Even when we exclude from consideration foreign shareholders and other non-resident earners, as was in fact done in constructing Tables 39 and 41,<sup>3</sup> there is still the problem of defining the resident. For, in fact, a large part of Northern Rhodesia's European population is only temporarily resident, and spends a large proportion of its income abroad while on leave, or on pension, or for its families. It is difficult to be logical on these matters, for the ultimate criterion by which these tables should be judged is that of their usefulness. For example, although the administrator needs to know what proportion of the national income is consumed and what proportion is saved, he has very little interest in the distinction between savings and consumption expenditure made in the United Kingdom, or elsewhere abroad, by persons who intend to leave the colony before they realise their savings, and who do not even spend the interest therein. Hence, in Table 40, item 43 does not represent the whole of the personal consumption of goods and services by Europeans.<sup>4</sup> It excludes expenditure on non-resident wives and

<sup>1</sup> See below, p. 63 and p. 66.

<sup>2</sup> As estimated for Cmd. 6623 and the other issues of this annual white paper on national income.

<sup>3</sup> See below, p. 63 and p. 66.

<sup>4</sup> See below, p. 64.

families, and on commitments which arise out of the fact that the European inhabitants of the colony are also residents of another country. This kind of expenditure, whether it represents saving or consumption, is included in item 57 of Table 40.

In practice, of course, not all of Northern Rhodesia's European residents are temporary residents, and there are degrees of permanence. We have, therefore, to remember that any conclusions as to the standard of living in the colony which are based on a reduction of the totals in Tables 39 or 41 to a per head basis, are partly vitiated by the fact that not all who subsist on these incomes form part of the population.

The second main set of problems arises from the existence of an appreciable subsistence economy. In effect, large numbers of the colony's inhabitants engage in productive activity, not for money incomes or with a view to trading their produce, but to satisfy the current needs of themselves and their families.<sup>1</sup> Broadly speaking, the national income investigator in an advanced economy seeks to measure the value of those goods and services which are customarily exchanged for money.<sup>2</sup> Even when he includes imputed rent, or the produce of allotments, he is including the value of goods and services which can be said to be customarily, though not invariably, exchanged for money. If this criterion were applied to an African national income calculation, it would result in the exclusion of a large proportion of the colony's production of goods and services, and all or most of the real income of at least a quarter of the population.

So it is necessary to measure the volume of subsistence activity, and also to evaluate, in money terms, the many goods and services which were never intended to be exchanged for money, and for which there may be no recognisable market price or factor cost.

The solution attempted to the problem of evaluation was arbitrary. It was based on what was believed to be a reasonable approximation to the true state of affairs. How closely it did relate to the truth, however, has yet to be tested, in investigations made on the spot. A system of hypothetical prices was set up, based on market prices adjusted for cost of transport to the market. Market price was established, as far as possible, for each main centre, and prices in the remote parts of its surrounding area were arrived at by deducting transport costs. In practice, the price for each commodity at the chief town of the province was found, or estimated, and it was assumed that most traded commodities were produced within 10 miles of the town, and that after about 40 miles no organised trade would occur. This gave an average price for goods produced by subsistence producers, of market price less cost of transporting 20 miles. The method is very crude, but it seems certain that for most products there is a 'customary price' in subsistence areas, and that this must have some relation to prices in the nearest area of

<sup>1</sup> The number of subsistence producers was officially estimated in 1938, at nearly a quarter of the taxable population (i.e. of all adult males of 18 years or over who are not specifically exempt because of some physical disability). But it should be remembered that most of the others produce the major part of their own, and their families', food and clothing for most of their lives, so that the subsistence economy is large and all-pervading, if seldom pure.

<sup>2</sup> See also above, pp. 19-20 for a discussion of this point.

possible trade. It is, of course, impossible to claim any but a very limited meaning for money values which are thus arbitrarily calculated.

Having decided to include subsistence activity in the national income calculation, it was necessary to be able to define it so that it did not include all human activities. For example, in the United Kingdom it is the practice to exclude unpaid domestic labour, i.e. the household activities of wives or dependents. In a subsistence area where labour is normally unpaid and where labour is organised on a domestic basis, the bulk of the agricultural work falling on women, it is not possible to pursue an analogous policy. The course taken in this experiment was dictated largely by practical considerations, and was again very arbitrary. Where the women's services resulted in the production of a tangible commodity which could be evaluated, these were included in income. For example, all agricultural crops were included, and such items as beer and meal were included as finished articles. On the other hand, the time taken to collect firewood, or to cook the meals, was not evaluated for inclusion in the calculation, although these activities were part and parcel of other productive activities, from which the local people would probably not be able to distinguish them.

These two sets of problems, and their implications, do not exhaust the difficulties which were met with in this experiment. There are many ways in which the Northern Rhodesian economic and social framework differs from that of the United Kingdom or of other advanced economies. Labour, for example, is much more mobile as between different countries in Africa than is the case in Europe. This feature of African economic life recalls, in another form, the problem of defining a resident. At any one time there is a large number of Northern Rhodesian men at work in Southern Rhodesia or the Union. It is more important to the administrator to know what the migrant labourer sends back to the colony, than what he earns, and spends, abroad. Nevertheless, the emigrant labourer is liable to Northern Rhodesian taxation, and to that extent his activities in the South African mines are logically part of the net taxable income<sup>1</sup> of Northern Rhodesia, if not of its net national income.

Here again the criterion followed was practical rather than theoretical. To attempt to calculate the total income of Northern Rhodesia's emigrants, some of whom will never return, and to include it in the colony's national income, is a task whose difficulties appear to outweigh the advantages. The solution adopted was to include only the homeward remittances or imports of emigrant labourers (less the outward flow on account of immigrant labourers)<sup>2</sup> and to regard the remainder of the labourer's income as part of the income of the country in which he is working.

Another example may illustrate the effect of differences in social practice. It is usual in the United Kingdom calculations of national income, to exclude the income of prostitutes. This is so not only because it would be difficult to find the evidence for an estimate, but also because it does not represent a return for 'productive activity', at least according to the prevailing social

<sup>1</sup> Tables 38 and 40, below, relate to net taxable income.

<sup>2</sup> See item 8 of Table 40 and item 3 of Table 42, pp. 64 and 67, below.

code in the United Kingdom. In Northern Rhodesia, however, the organisation of the mining industry on the basis of migrant labour has made prostitution an integral part of the economy. It, therefore, seemed useful to be able to include the income of prostitutes, which was at least as easy to estimate as was the income of other persons working on their own account in non-agricultural occupations. Clearly, this is not a problem to which the answer can be found at a distance from the territory. This, and many other such problems, can be provided with a definite solution only after specific local enquiries.

In effect, all the solutions which were adopted during the course of the experiment were provisional. They seemed, in view of what was known about the economy, to provide the most useful interpretation and analysis of its economic life. Until they have been tested in the light of practical local experience in the construction and use of national income tables, however, they cannot be regarded as providing much more than some tentative suggestions, and a basis for discussion. Indeed, until the economic and social framework of Central Africa has been more fully explored, the problems themselves cannot be formulated comprehensively and intelligibly.

## THE ESTIMATES

### PART I. THE INCOME COLUMN.

The income column of the income-output-expenditure table was constructed first. It was built up on a basis of income tax returns, employment and wage statistics, and similar information.

#### I. EUROPEAN INCOME.

The 1938 Blue Book estimate of the total number of male and female Europeans in the colony, and the 1931 Census proportions of those gainfully occupied, were used in reaching a figure of about 6,700 for the total number of gainfully occupied Europeans. Of these, 2,140 were assessed to income tax in the year 1938-39, and the tax returns gave enough information on the numbers and average earnings in each range of income to enable an income distribution table to be drawn up. The remaining 4,560 were assumed to earn, on an average, less than £545 per annum and more than £300, giving an average of about £390.<sup>1</sup> On these assumptions, there were 2,140 persons assessed to tax and earning £1,448,000, and 4,560 persons not assessed and earning £1,780,000, which gave a total income for the European population of about £3,228,000. This result gave some idea of the order of magnitude of the total European earnings, although it does not include income in kind, and since it is based on deductions from the income tax returns for 1938-39 it refers in the main to the income earned in 1937-38.

An attempt was then made to build up the total by finding so far as possible

<sup>1</sup> This was the average for assessed single men in this income range.



the number employed in each occupation in 1938 and their earnings (or average earnings). This method of approach resulted in a first approximation for total income of £3,521,000. In the face of the previous estimate it seemed likely that this was too high, and the details were reduced at all points where an overestimate seemed possible. The result was then in the region of £3,483,000. This was as low as it seemed possible to go on the available evidence. It was, however, to be expected that this second estimate would exceed the first, based on income tax returns, partly because it covers the incomes in kind, and partly because it relates to the calendar year 1938, in which, so far as can be ascertained, European incomes were higher in general than for 1937-8.

The table which follows gives in some detail the estimates which were made to build up this total. The information on which they were based was derived from a variety of sources, including income tax returns, the 1931 Census results, the 1938 Blue Book, the Pim report,<sup>1</sup> the Rhodesia Railways Bulletin, the Lands, Mines and Surveys Department's 1938 report, and other departmental reports.

TABLE 9. The earnings of European individuals

Occupation or industry	Nos. estimated engaged	Estimated total earnings £
1. Government service	655	434,000
2. Mining	2,730	1,645,000
3. Railways	750	375,000
4. Religion	250	50,000
5. Personal service	240	43,000
6. Trade	1,050	510,000
7. Farming	350	115,000
8. Professions	130	65,000
9. Miscellaneous employments	535	161,000
10. Rents, profit, interest and income from abroad	—	85,000
Total	6,690	£3,483,000

In this table the first three items can all be assumed to have a margin of error varying from 5% to 10%. The remainder of the items have wider margins of error, but the former figures account for a substantial proportion of the whole, and the margin of error in the total can be put at about 12% on a conservative estimate.

## NOTES ON THE ESTIMATES IN TABLE 9.

1. This item was derived from the Blue Book.

2. The Lands, Mines and Surveys Department gave £1,519,000 as the salary bill of Europeans in 1938. The estimate in Table 9 contains an addition for incomes in kind which were not inconsiderable in the case of employees on the mines.<sup>2</sup>

<sup>1</sup> *The Report of the Commission appointed to Enquire into the Financial and Economic Position of Northern Rhodesia*, Col. No. 145.

<sup>2</sup> The allowance is a conservative one. It works out at about £46 per head. Pim puts the value of these amenities at £100 per head. *Op. cit.* p. 54. Here we attempt to allow only for the cost of the amenities enjoyed in Northern Rhodesia, i.e. excluding such items as passage home on leave.

3. The estimates of numbers employed on the railways, and their average earnings, were derived from information in the 1931 Census and the Rhodesia Railways Bulletin. The figures given for numbers of those employed may be an overestimate, but the estimate of average earnings is so much lower than for government service or for mine employees as to suggest that it is an under-estimate.<sup>1</sup>

4-10. The remainder of the estimates of numbers engaged were obtained either by generalising the results of the 1931 Census, or by estimates given in special reports.<sup>2</sup> Item 9 was a residual item as far as the estimate of numbers engaged was concerned. Average earnings were arbitrarily estimated, in part on the basis of scattered pieces of information on earnings in various industries, in part on the basis of suggestions from persons in Northern Rhodesia, to whom the preliminary estimates were submitted, and in part also as a result of conclusions formed as to the proportion of untaxed to taxed incomes in the various industries. Here again, the earnings seemed more likely to under-estimate than over-estimate the true position, but estimates were kept to the minimum, because all general information suggested a tendency to over-estimate European incomes.

## 2. COMPANY INCOMES.

Company incomes were derived from two main sources—company reports and income tax returns. Unfortunately the last available income tax report referred to the assessment year 1938-39. Since most of the commercial companies had not completed their financial year 1937-38 when they returned assessment forms in spring 1938, tax charged in 1938-39 relates for the most part to income earned in 1936-37, although in some cases it might refer to the calendar year 1937 or to the fiscal year 1937-38. The mineral companies' and transport companies' profits could, however, be estimated from company reports or from published operating statistics. This left other foreign companies' and Northern Rhodesian companies' incomes to be estimated on the basis of the 1938-39 tax returns. Since the evidence for the mineral and transport companies suggests a rise in the income earned in 1938, compared with the income assessed in 1938-39, it seemed reasonable to scale up the deductions reached from the tax returns by about 5%. Thus the following table was reached:

TABLE 10. Company incomes

	Estimated profits and interest £
1. Four large mineral companies	4,514,000
2. Other mineral companies	143,000
3. Royalties	211,000
4. Transport companies	477,000
5. Other foreign companies	61,000
6. Total foreign companies	5,406,000
7. Northern Rhodesian companies	389,000
8. Total company income	£5,795,000

<sup>1</sup> On balance it seems more likely that this item is an under-estimate perhaps up to about 9%, but the general evidence suggested that European income was being over-estimated.

<sup>2</sup> For example Pim's estimate of 350 was taken for the number of farmers. *Op. cit.* p. 210.

In the above table items 1 and 3 are close estimates, and item 4 is probably within 10% of the truth. Hence, although the other items have margins of error of 20% or 30%, the margin of error in this total is probably not more than about 4%.

#### NOTES ON THE ESTIMATES IN TABLE 10.

1. Company accounts were available for the four large mineral companies.
2. Total output, and also wage, statistics were available for other mineral companies, and with this as background profits were estimated by analogy with the large companies.
3. Figures for royalties were available in company accounts.
4. Operating statistics, and hence operating surplus, were available for the railways from official reports. The proportion of costs met out of operating surplus was estimated by analogy with the mineral companies.
- 5-8. These items were derived from the income tax department's returns of company incomes assessed. The proportion going to Northern Rhodesian companies was estimated on the basis of the figures for double taxation relief which apply to foreign companies.

#### 3. GOVERNMENT INCOME.

In the income column, wages and salaries are entered separately in the sections dealing with European and African incomes, and it remains to enter the government's income from property, and its profits from trading services. This appears as a separate item in the income column, together with government income from abroad.<sup>1</sup>

#### 4. AFRICAN INCOME.

##### (a) *Employed Africans.*

The Native Affairs Report gives for each province the number of man-months worked, together with the range of money wages, and of the value of rations and allowances, for each of the principal African populations. More detailed information on specific industries, and on the composition, cost, and value, of ration scales was obtained from the departmental reports, the Pim report,<sup>2</sup> and Godfrey Wilson's essay dealing with his Broken Hill survey<sup>3</sup> in 1939-40. Where the range of wages, or rations, was given, rather than the average, and where information from other sources did not indicate the approximate numbers in each wage-group of an industry, the data on other, similar industries were used to indicate, at which point in the range was the true average. The tendency was for some estimates of average earnings to be over-estimated. On the other hand, it is probable that the Native Affairs Report estimates of man-months worked will err on the side of under-estimation. It is most unlikely that it would account for all casual or part-

<sup>1</sup> See below, Table 40, item 14, and the corresponding items in succeeding income-output-expenditure tables.

<sup>2</sup> Op. cit.

<sup>3</sup> Godfrey Wilson, *Essay on the Economics of De-tribalization in Northern Rhodesia*, Part II. Published by the Rhodes-Livingstone Institute, 1942.

time labour, or for labour employed by Asiatics and Africans, even if it is complete for European labour. On balance, therefore, it seemed reasonable to assume that these two factors roughly cancel each other out.<sup>1</sup> The results of these estimates are given below in Table II.

TABLE II. Earnings of African employees

Industry and occupation	Man-months worked	Value of labour £
1. Mines	285,053	761,500
2. Agriculture	153,917	69,500
3. Domestic service	138,131	83,700
4. Industry and manufacture	75,615	66,000
5. Railways	75,340	87,200
6. Building	67,188	39,500
7. Government service	63,944	58,300
8. Teaching and mission work	22,000	22,000
9. Other (largely commercial)	39,451	31,800
10. Total	920,639 <sup>2</sup>	£1,219,500

Not enough is known about the comprehensiveness of the figures included in the above estimates of man-months worked to justify any optimism about the margin of error in this total. Items 1, 5 and 7 are probably fairly reliable returns, at least as far as estimates of man-months and average money wages are concerned, but the need to allow for incomes in kind detracts from their reliability. On the assumption that for the other items the data on man-months worked, and on money and earnings, were originally founded on a reasonably firm basis of collected returns, the margin of error in the resulting estimates should not exceed 20% in some cases and 30% in others. For the total result, however, it is not possible to assume a margin of error of less than 17%.

#### NOTES ON THE ESTIMATES IN TABLE II.

1. The wages paid to African labour by the mines were recorded in the report of the Lands, Mines and Surveys Department. Rations and other allowances in kind, such as food, medical services, entertainment, and housing, had to be estimated. Pim gives a fairly full discussion of the value and cost of these extras, and his figures formed the basis of the above estimate.<sup>3</sup>

2. Very little information was available for agriculture beyond the range of money wages in each province, and the value of rations in two provinces. The average money wage was put fairly low—at 20% above the lowest point on the range, and the cost of rations to the farmer was put well below the recorded value—at 1s. 5d. per month in the railway provinces and 1s. 4d. per month in the outlying provinces.

<sup>1</sup> The over-estimate of average earnings tends to appear in items where information is scanty (for example, domestic servants, or commercial employees), and it is probably just in these items that the estimate of man-months falls short of the truth.

<sup>2</sup> This represents an average of about 76,700 persons at work throughout the year. The total number of persons recorded as employed in Northern Rhodesia is recorded at 97,976, however. This means that each person works on the average only about 9 months in the year.

<sup>3</sup> Op. cit. pp. 52-53.

3. Money wages were put at a low point<sup>1</sup> on the range for domestic servants also, but rations were put at a higher point,<sup>2</sup> and were not reduced from value to cost. This was in order to allow for the unrecorded extras which domestic servants enjoy.

4-9. For the remaining items a similar kind of procedure was followed. The point on the range of money wages, or the ratio of cost of payments in kind to their value, was found either on the basis of special data concerning the occupation, or by analogy with the workers studied by Godfrey Wilson in Broken Hill, or by analogy with other industries. Item 7 was well supported. Items 5 and 8 are probably within 10% of the truth, items 4 and 6 within 20%, and item 9 within 30%. Item 9 seems most likely to be an under-estimate.<sup>3</sup>

## 6. AFRICANS WORKING ON THEIR OWN ACCOUNT FOR CASH.

The Native Affairs Report also estimates the numbers of those making their livelihood at home in the production of crops for sale, of those engaged in other forms of economic production and distribution, and of those engaged in the production of crops for subsistence purposes. These estimates are inevitably fairly rough, if only because the three categories overlap to an unknown, but considerable, extent. The estimates of average cash earnings are based on miscellaneous pieces of evidence on actual and relative earnings.<sup>4</sup>

TABLE 12. Earnings of independent workers<sup>5</sup>

Occupation or industry	Nos engaged	Earnings £
1. Farmers	37,900	117,500
2. Other independent male workers	22,900	210,700
Total independent males	60,800	328,200
3. Women workers	25,000	125,000
Total independent workers	85,800	£453,200

The margin of error in the above estimates is very considerable and cannot be put at less than 50%.

## NOTES ON THE ESTIMATES IN TABLE 12.

1. Farmers engaged in economic production of crops for a living<sup>6</sup> were assumed to get an average net cash return of £3.1 per annum, which is

<sup>1</sup> At 12% above the lowest point.

<sup>2</sup> At 30% above the lowest point.

<sup>3</sup> The lack of uniformity in the provincial returns relating to this item suggests that it is by no means comprehensive. On the other hand, wage rates may well give too rosy a picture of the situation.

<sup>4</sup> The most important single source of information was Godfrey Wilson's essay, *op. cit.* above. An allowance has been made for the over-estimate which the analogy with Broken Hill would tend to produce.

<sup>5</sup> Excluding subsistence producers.

<sup>6</sup> As opposed to those who sell only when they have surpluses, or are attracted by the market. It is assumed that 'farmers', as opposed to subsistence producers, have a definite acreage set aside for economic crops, although they will tend to produce their own and their families' food on a subsistence basis.

equivalent to 25% of the average earnings from employment of all natives who took employment.<sup>1</sup>

2. Other independent workers were assumed to earn £9.2 per annum, or about 75% of the average earnings of all natives who took employment.<sup>2</sup> The average profit for the independent worker in Broken Hill was about equal to the average employee's income, but this is probably too high as a generalisation for the colony as a whole.

3. This includes women workers in the towns, such as beer-brewers, nurses, etc., and also prostitutes. They are not included in the official figures, and their number was estimated on the assumption<sup>2</sup> that women in urban areas equalled about 50% of men in employment, and that about 50% of these women earned on their own account. This is probably an under estimate of the proportion of women working on their own account and an over estimate of the number of women in the towns, so the two errors should tend to cancel each other out. Most women cultivated small plots of land and sold, or (with their families) consumed, the produce. Others were engaged in beer-brewing, prostitution, nursing, and so on. It was assumed that each of these women earned in cash or in kind about £5 per annum. Although this is a very lightly-founded estimate it does not seem probable that it is an over-estimate.

(c) *Asiatics and Coloured People's Incomes.*

No information was available on the earnings of Asiatics and coloured people in Northern Rhodesia. A guess amounting to about £100 per adult male, and £74,000 in all, was therefore entered for this item.<sup>3</sup>

(d) *Remittances from Migrant Labourers.*

It was assumed by analogy with Broken Hill conditions<sup>4</sup> that migrant labourers sent an average of £1.75 per annum in (or out) of the colony. This may be high for immigrant labourers earning at Northern Rhodesian wage rates, but it is probably low for emigrant labourers earning at the rates prevailing in Southern Rhodesia or the Union. In effect the net inward flow may have been underestimated. Moreover, it is possible that the number of immigrant labourers may have been over-estimated, based as it is on 1931 proportions,<sup>5</sup> whereas the number of labourers employed abroad was taken from the Native Affairs Department's estimates. This again would suggest the possibility of under-estimate in the net inward flow. On the other hand, a larger proportion of those who have gone as far afield as the Union or Southern Rhodesia will be permanent, or semi-permanent, absentees from

<sup>1</sup> Note this is *not* the average earnings per native actually in employment. It is the average for the whole 98,000 recorded as having been in employment at any time during the year. It is, therefore, considerably below the average rate of wages.

<sup>2</sup> Again by analogy with Broken Hill conditions.

<sup>3</sup> By analogy with conditions in Kenya (see the *Report of the Commission on the Financial Position and System of Taxation*, Col. No. 116, 1936), and in Nyasaland (See below, p. 70).

<sup>4</sup> See Godfrey Wilson's essay, *op. cit.*

<sup>5</sup> This was a year of considerable activity in Northern Rhodesian mining areas.

the villages than would perhaps be the case in Broken Hill. These would not send anything at all, or very little. In brief, it seemed advisable to leave the result at about £81,000, bearing in mind the possibility of under-estimate.

(e) *Subsistence Incomes.*

No separate estimate can be made of subsistence incomes of Africans for this column. It equals subsistence producers' output, as estimated in the next section.<sup>1</sup>

The above estimates cover, so far as is known, every section of the Northern Rhodesian economy, with the exception of the subsistence producers, and give rise to the following table of incomes. Table 13 is thus the basis of the first column of the income-output-expenditure table for Northern Rhodesia. Since it includes the income of foreign companies as well as the income of residents, it represents national taxable income, according to the definitions followed in this enquiry. To convert it to a table of net national income, it would simply be necessary to eliminate item 5, and to add to item 9 the taxation paid by foreign companies to the Northern Rhodesian government.

TABLE 13. Net national taxable income

The first, independent, estimate<sup>2</sup>

	£000	£000
<b>I. Income of Individuals</b>		
1. European residents	3,483	
-2. Africans		
(a) Independent producers	453	
(b) Wage-earners	1,220	
(c) Net remittances from migrant labourers	81	
3. Asiatics and coloured people	74	
4. Total income earned by individuals		5,311
<b>II. Company Incomes</b>		
5. Foreign companies	5,406	
6. Northern Rhodesian companies	389	
7. All companies		5,795
<b>III. Government Income</b>		
8. Government income from property in Northern Rhodesia and profits from trading services	202	
9. Income paid to property- or pension-holders abroad	272	
10. Government income from abroad	40	
11. Total government income		514
12. Total net national taxable income <sup>2</sup>		£11,620

The margin of error in the above total, found by combining the error of its parts, is in the region of 10%, and the probability is that it errs on the side of over-estimation. We shall find that when these items are checked against items from other independent sources we can reduce the margin of error in the final total.

<sup>1</sup> See below, pp. 38-44.

<sup>2</sup> Excluding subsistence income.

## PART II. THE OUTPUT COLUMN.

The next task was to build up the output column from new sources, and to check the results against the estimates already reached for the income column. In this part, therefore, the industries are taken separately and, so far as possible, the net output of each is estimated by approaching it from the point of view of gross output less raw materials and purchased services.

## I. THE MINERAL INDUSTRY.

The mineral industry makes the largest single contribution to Northern Rhodesia's national income. In value its products dwarf those of all other industries, and even when the value of imported services such as the use of capital are excluded, its contribution to the national product exceeds that of agriculture.

The principal sources for the estimates of net output which follow, were the company reports of the four large mineral companies,<sup>1</sup> the Lands, Mines and Surveys Department's annual reports, and the annual report of the Customs Department. The total value of mineral output and the salary and wage bill for all mineral companies could be found in the Lands, Mines and Surveys Department's report. The value of the smaller companies' contribution to total output (at London market price) was about 3%, and their contribution to the total salary and wage bill was less than 2½%.<sup>2</sup> On the whole, therefore, the company reports which were available enabled estimates to be made in some detail, and only a small adjustment was necessary to cover total mining operations.

Most of the items in the following table were obtainable directly or indirectly from information given in the company reports. Item 2, however, had to be deduced primarily from an inspection of import statistics, and item 6 was a guess based on several small pieces of incomplete evidence. Item 6 probably failed to account for some forms of local raw materials, or purchased services, and is therefore likely to be an under-estimate.

TABLE 14. Output of Mining Industry. First Approximation

	£000	£000	£000
1. Receipts by sales of mineral companies			10,684
Less raw materials and purchased services:			
2. Imported raw materials	704		
3. Railage and realisation	1,471		
4. London office expenses	144		
5. Other imported services <sup>3</sup>	537		
6. Local raw materials and purchased services	52		
7. Total raw materials and purchased services	2,908		
Less depreciation and maintenance:			
8. Transfers to depreciation reserve	423		

<sup>1</sup> The four companies for which company reports were available were Rhodesia Broken Hill Development Co. Ltd., Mufulira Copper Mines Ltd., Rhokana Corporation, and Roan Antelope Copper Mines Ltd.

<sup>2</sup> Total output, and total salaries and wages (excluding payments in kind), were obtainable from the Lands, Mines and Surveys Department's report.

<sup>3</sup> Largely outside refining.



9. Less all purchased materials and services and depreciation and maintenance	3,331	
10. Net taxable output		7,353
Less remittances to foreign property holders:		
11. Royalties	211	
12. Operating surplus	<u>4,658</u>	
13. Less all remittances to foreign property holders	4,869	
14. Net national output of mining		<u>2,484</u>

The estimate of the value of net national output arrived at by the above means is, in effect, an estimate of the total of wages, salaries, rents, profits, and interest earned in the mineral industry by Northern Rhodesian residents. It was arrived at by a process of analysis and deduction. We could, however, approach the problem differently and build up an estimate of net output by the opposite process of synthesis and accumulation. That is to say, we could find what wages, salaries, profits, rent, and interest were earned by Northern Rhodesian residents in connection with the mining industry, and aggregate them to give net national output. Such an alternative estimate would provide a useful check on the result produced by the output approach.

Part of the material for this estimate has already been produced for the income section of the fundamental table.<sup>1</sup> There, it was found that the earnings of the European employees on the mines was about £1,645,000, and that the value of the wages, in cash or kind, which were paid to Africans, amounted to about £761,000. This gives a total of £2,406,000, plus the value of rent, and interest, and other local charges which do not appear elsewhere in the output column. It has, in effect, been assumed that these other charges are equal to about £78,000, or the difference between the income estimate and the output estimate.

On these assumptions, an income and output account for the mining industry can be drawn up as in Table 15, below.

TABLE 15. Mining Industry Account

Income	£000	Output	£000
1. European earnings	1,645	5. Total value of receipts by sales	10,684
2. African earnings	761	6. Less raw materials, purchased services and depreciation	3,331
3. Other incomes	78	7. Less royalties, dividends, undistributed profits and other remittances abroad	4,869
		8. Less all earnings received by persons in other industries and in other countries from Northern Rhodesian mining industry	8,200
4. Net income of the mining industry	<u>2,484</u>	9. Net output of the mining industry	<u>2,484</u>

For both columns in the above account the estimates were derived from reliable sources of evidence. Moreover, the two columns were derived from different sets of data (except in the case of item 3, which is residual). Unless there has been any serious misinterpretation of the material, the total estimate

<sup>1</sup> See above, p. 26 and p. 29.

can be regarded as fairly close and reliable. An examination of the probable errors in the individual items leads to the conclusion that the margin of error does not exceed 5%. If the taxable output<sup>1</sup> of the mining industry is considered the error is even smaller—under 2%.

## 2. AGRICULTURE, LIVESTOCK, FORESTRY.

### (a) *European Agriculture.*

For most crops the Department of Agriculture gives the quantity of European output produced and, in some cases, the total quantity of European output sold, but it does not give values. In the table which follows, amounts consumed on the farm were estimated, where the information was not given, by analogy with cases for which there was information. Farm values were assumed to be about 75% of the wholesale export price (which could be obtained from trade statistics) unless specialised information was available on the farm price of particular crops. European production of animal products was not separately recorded, however, and the figure of animal products is based on the assumption that European farmers produced half the estimated value of the cattle slaughtered in the European butcheries, and of the poultry and eggs estimated to have been produced, together with the value of all the fresh milk estimated to have been consumed by Europeans, and all the butter estimated to have been produced. This is a rough total based on calculations which are described in the next section,<sup>2</sup> but it is probably not very far out.

TABLE 16. Output of European Agriculture. A First Approximation

Commodity	Amount	Value £
1. Maize	206,024 bags <sup>3</sup>	76,300
2. Wheat	5,021 bags	4,500
3. Groundnuts	892 bags	300
4. Potatoes	2,764 bags	1,700
5. Market garden crops	1,020 tons	8,200
6. Fruit	17,187 hundreds	7,900
7. Tobacco	2,065,825 lb.	80,100
8. Coffee	505 cwt.	1,000
9. Total value of European crops		180,000
10. Value of European animal and dairy products		64,000
11. Total farm value of European agriculture and animal products		244,000
12. Less materials <sup>4</sup>		35,000
13. Total net value of European agricultural output		£209,000

It seems possible that the average farm value of output has been pitched too high, although if, as is probably true, most farmers deliver their own

<sup>1</sup> i.e. item 5 less item 6.

<sup>2</sup> See below, p. 37. Imports are, of course, excluded.

<sup>3</sup> Excluding a proportion estimated to have been fed to cattle.

<sup>4</sup> i.e. machinery, implements, etc. It was deduced from an inspection of the import list. It is unlikely to be too low unless substantial materials were bought locally which have not been accounted for.

produce to the railhead, the proportion of total wholesale export value which must be paid by them in transport and distribution charges will not be high. Moreover, it seems probable that such errors as occur in the Department of Agriculture's table of quantities will be errors of omission. On balance, therefore, item 9 should not be too high. Item 10, however, looks high in comparison with item 9, especially when it is considered that large parts of Northern Rhodesia are in the grip of tsetse fly.

Approaching the problem of net output from the income side, and summing the items for European income and African income from agriculture, we get £184,000. There is thus a gap of £25,000 between the estimates. Bearing in mind that the European incomes from agriculture should include rent and interest charges as well as the net profits of the farmer, and the salaries of his European employees, it seems reasonable to scale up this item in drawing up an account for the industry. On the other hand, it seems probable that item 10 in the above table is an over-estimate. These are therefore the items which bear the main weight of the adjustments necessary to produce the account given below.

TABLE 17. An account for European agriculture

Income	£000	Output	£000
1. European incomes	127 <sup>1</sup>	4. Value of European crops	180
2. African incomes	70	5. Value of European pastoral products	52
		6. Gross farm value of European agriculture	232
		7. Less value of materials	35
3. Net income from agriculture	197	8. Net output of agriculture	197

Unless there have been serious and unexpected omissions from the Department of Agriculture's figures, it seems most unlikely that the total net value of the output of agriculture could exceed £215,000. On the other hand, given that item 1 in Table 17 includes salaries profits, interest and rent,<sup>2</sup> and that item 2 probably failed to account in full for the numbers of those employed casually, it seems most unlikely that net income from agriculture could have fallen below about £180,000. In effect, therefore, the margin of error in this total appears to be in the region of 9%.

### (b) *Animal Products.*

It proved extremely difficult to form a satisfactory estimate of the value of animal products in the colony. Not only was it difficult to find any sufficient basis of recorded data for all but a very small-section of the field; in the case of the bulk of the animal products made available for consumption during

<sup>1</sup> This item includes rent of farm land and buildings and interest on farm capital, part of which is paid by the farmer to owners of the land or capital.

<sup>2</sup> Assuming about 70,000 acres under cultivation by Europeans as estimated by Pim (Col. No. 145, p. 15), rent could not have been less than about £18,000. If net income from agriculture were £180,000, net profit per farmer could be about £275 p.a., or (assuming that there were about 40 farmers earning the taxed income of £25,000) the untaxed farmers would be earning a net profit of about £230 per annum on the average. Those who owned their own farms would also reap the reward of rent.

the year, there is not even an official estimate of the quantities involved, while values have often to be deduced by a complex process of analogies.

Some figures are available for animals slaughtered in European butcheries,<sup>1</sup> and prices were fixed by the Cattle Marketing and Control Board for cattle at various average weights. The Veterinary Department gives estimates in its annual report of the amount of cattle, goats and pigs owned by Africans. It also gives figures for the amount, and farm value, of butter output, and of the number of elephants killed. The by-products were exported and estimates of their value were obtained from trade statistics. There has been little progress in the utilization of other by-products, with the exception of dried blood used for manure, and this was presumed to be included in the total value of agricultural output.

All other items in the following table, and particularly items 5 and 8, are guesses based on the flimsiest evidence.

TABLE 18. Output of animal products. First approximation

Products	Quantity	Value £
Cattle, sheep, pigs and goats		
1 Slaughtered in European butcheries	20,335 head	56,000
2 Slaughtered in villages	30,000 head	44,000
3 Total pastoral animals	50,335 head	100,000
Game		
4 Elephants	900 head	12,000
5 Other game	80,000 head	32,000
6 Total game	80,900 head	44,000
Dairy products		
7 Fresh milk consumed by Europeans	13,750 galls.	3,000
8 Fresh milk consumed by Africans	150,000 galls.	1,000
9 Butter	381,538 lbs.	29,000
10 Poultry	35,000 head	1,000
11 Eggs		8,000
12 Total dairy products		42,000
By-products		
13 Hides and skins		19,000
14 Ivory		10,000
15 Total by-products		29,000
16 Total net value of all animal products		£215,000 <sup>2</sup>

#### NOTES ON THE ESTIMATES IN TABLE 18.

1-3. Enough information was available to produce estimates of the number, average weights, and average values of the cattle, sheep, pigs and goats slaughtered in European butcheries. Item 1 was judged to be within about 18% of the truth, and seemed more likely to be an overestimate than

<sup>1</sup> *The Report on the Utilization of Animal By-Products in the Colonial Empire, 1939*, gives the average number of cattle, sheep and pigs slaughtered annually in the municipal abattoirs of Northern Rhodesia. This report is based on a questionnaire sent out in 1938-39. In addition, the Veterinary Department gives the figure for cattle slaughtered in 1938. These two sources provided the basis of an estimate of the number of each kind of livestock slaughtered in European butcheries in 1938.

<sup>2</sup> Of which European output is estimated at £52,000 and African output at £163,000.

an underestimate, unless there is a considerable amount of unrecorded slaughter of European cattle or of cattle produced for sale by Africans. On the slaughter of cattle in the villages little was known, however. All the evidence (mainly qualitative) which could be collected, and all the opinions which were given, suggested that at least as much slaughter occurred in the villages as in the official slaughterhouses, but not more than twice as much. Item 2 was judged to have a margin of error in the region of 75%.

4-6. Estimates of the number of game slaughtered, of their average dressed weight and average value could only be wild guesses. The number of elephants slaughtered is known—probably fairly accurately—but the meat obtainable therefrom, and its average value, had to be guessed. The Faunal Survey<sup>1</sup> gives such information as the average weight of each type of animal, and indicates the probable proportions of each kind. It also gives an avowedly rough estimate of the number of game slaughtered for a given number of firearms held by Africans. While it provided most of the ultimate basis of the estimates contained in items 4-6 of Table 18, it did not justify the arbitrary assumptions which had to be made. This item seems to have a margin of error of about 75%.

7-12. The estimate for butter is relatively reliable, unless a considerable amount of unrecorded buttermaking goes on. The estimate for the value of eggs produced assumes that African consumption is very small, but that European consumption of home-produced eggs can be estimated on the assumption that the recent fall in imports was accounted for by an increase in home production. Estimates for milk and poultry were based on arbitrary assumptions relating to local consumption habits and on some qualitative data. Item 12 probably has a margin of error of about 20%, and is more likely to under-estimate than over-estimate the truth.

13-15. Item 13 was pitched high—roughly at the wholesale value of actual exports—to allow for home consumption of hides and skins. The export value of ivory was nearly £12,000. Item 15 probably has a margin of error of about 10%.

In sum, and allowing for the fact that some of the margins of error in this table cancel out others, the margin of error in item 16 works out at something like 36%. On balance it is more likely to be an over-estimate.

### (c) *African Agriculture.*

The value of net output of African agriculture was calculated by a series of rough estimates. The aim was to divide the population into families;<sup>2</sup> to distribute the families into the agricultural areas distinguished by the Ecological Survey;<sup>3</sup> to find the average size of garden and the average distribution of crops therein; to find the average yield for each crop in each

<sup>1</sup> *The Report on the Faunal Survey of Northern Rhodesia, 1934.*

<sup>2</sup> It was assumed that each woman represented a family. This assumption may have to be discarded in later estimates if field surveys prove it to be unrealistic.

<sup>3</sup> There were two Ecological Survey reports—one for North-west Rhodesia and one for North-east Rhodesia. The second appeared after the preliminary estimates had been completed. See below, Appendix II.

area, and to adjust these averages by allowing for (a) the excesses or deficiencies of the 1938 harvest in each area, and (b) the amount of labour which was available for agricultural work in each area. The totals were evaluated (except on the rare occasions when specific local prices were obtainable) by means of a set of price indices constructed on the basis of the cost of transport to what seemed to be the chief market areas.<sup>1</sup>

The foundation of these highly problematical calculations was the Ecological Survey. It was almost the only source of information on such points as agricultural areas, crop distribution, and distribution of the population into different agricultural areas. It was the principal source of information on the average size of garden, although on this point there were a number of estimates obtainable from agricultural department publications and other official reports. Much more was construed from the Ecological reports, however, than was ever intended by the authors, and much of the detail in the tables which follow is pure guesswork.

For example, the reports do not give the population in each agricultural area. That had to be deduced from maps showing the areas covered by each agricultural area, and from what was known of the size and distribution of the population of each district. Perhaps the most important single assumption that could be made in this calculation was that there was sufficient uniformity in the crop distribution pattern of the people of a given agricultural area to justify the deduction of an average pattern from the descriptions given in the Ecological reports. This is another of the many assumptions which will have to be checked in the field.

The first step was to form an estimate of the size and productive strength of the agricultural population. In the table which follows, the first column is constructed on the assumption that of the men employed in Northern Rhodesia itself about 25% could be regarded as available for agricultural activity, and that all the women and children, apart from the few estimated to be attached to the men living in urban areas, were in rural districts.<sup>2</sup> The second column gives the number of families, on the assumption that each available woman represents a family. The third column estimates the number of 'productive units' available, on the assumption that, of the population in the rural areas, able-bodied males and females constituted 1 unit apiece, and that children between 5 and 15, and males exempt from taxation, constituted  $\frac{1}{2}$  unit apiece.

This is a very rough and ready solution to the problem of gauging productive potentialities in a community where all members engage in agricultural activity. There are, for each community, definable groups of activities which are primarily masculine or primarily feminine activities. The relative productive efficiency of male and female labour differs for different tasks, and

<sup>1</sup> See above, p. 23. The chief market areas were Lusaka, Nkana, Fort Jameson, Abercorn and Mongu.

<sup>2</sup> The average number of man-months worked in 1938 was 9.9. It was assumed that about 25% of the men employed in Northern Rhodesia were available in villages at the crucial period for male agricultural activity, i.e. in the bush clearing season. It was also assumed that about 50% of those employed or engaged in non-agricultural activities had attached to them in urban areas 1 woman and 1 child who were thus not available in rural districts.

TABLE 19. The productive population for African agriculture.

	No. of individuals in rural districts	No. of families	No. of productive units
Barotse Province	236,660	83,600	147,500
Northern Province	302,200	105,400	176,400
Eastern Province	190,600	67,700	116,200
Western Province	95,400	32,200	57,200
Southern Province	127,480	41,700	77,200
Central Province	87,900	32,100	56,100
	<u>1,040,240</u>	<u>362,700</u>	<u>630,600</u>

their total efficiency can only be precisely measured if the sex pattern of labour specialisation is known. Moreover, the productivity of a man who is only home for part of the year will vary with the time of the year at which he is available. If he is at home at the clearing season, his labour will probably make a definite and, theoretically, measurable difference to the size of the garden. If he is at home at other parts of the year, the amount of help which he gives on the land may be almost balanced by the amount of work he creates for the women who have to feed him. Without much more detailed information on relative efficiencies of different kinds of labour, and on different specialisation of labour patterns, it is not possible to suggest any more logical solution to the problem of allowing for the effect of varying labour supplies on the output of native food crops.

The next stage was to distribute the families among the agricultural areas, and to work out a crop distribution pattern for each area. This was done largely from the Ecological Survey reports. Again the solution was rough because data were so scanty. In most cases the decision depended simply on information which gave the size of the average annual clearing, the usual rotation of crops, and the average length of time for which a given piece of ground was cultivated. This was probably sufficient to indicate the general orders of magnitude involved for the main crops in the main gardens. It gave little, if any, opportunity for assessing crop distribution in the smaller village gardens, in which a wide variety of crops were interplanted, and about which little was known apart from the average size and the principal crops. Hence the detailed results of a calculation based on this kind of data will inevitably be highly inaccurate for small items, and will probably not reflect to any useful extent the actual variety in foodstuffs produced. On the other hand, on the assumption that there is not a very great difference in relative values of different foodstuffs obtainable from a given piece of land at the subsistence level, it is probably enough to know the size of gardens, the kind of crops grown, and the yield, to get an idea of the order of magnitude of the value of output. In any case, no attempt has been made to give the results obtained in their full working detail. The crops have been divided into fairly wide groups, and the most that can be hoped from the results is that these principal orders of magnitude are not far from the truth.

Yields were sought, and obtained, from a wide variety of sources. The reports of the Agricultural Department over a period of ten to twenty years

were the main source of direct information. Even so, it was necessary, for some of the crops, to have recourse to the agricultural or nutrition reports of other territories in the same geographical area, such as Nyasaland, Southern Rhodesia, Tanganyika and Uganda. Where estimates of yield under native conditions were not available, records of the agricultural department's experiments were examined for yields of native control, or demonstration, or exhaustion plots. In practice, all the yields that were ultimately used had some basis in fact, although they often related to different times and different places in the case of the subsidiary crops.<sup>1</sup>

So far as possible, a range of yields was sought for each crop, a range that could be divided up into four main types of average yield—good, normal or satisfactory, poor and very poor. The point on the range which was taken for any one crop in a given district would then depend on the comments which the agricultural officer had made in his annual report on the harvest. If he had described the harvest as good, or above normal, then the top point of the range was used. If it was very poor, the lowest point was taken. As far as the subsidiary crops were concerned, it was possible to make this kind of adjustment for 1938 harvest conditions only in a limited number of cases, but for the staple crops it was always possible to obtain some opinion on the harvest over the greater part of the country.

Finally, it was necessary to make an estimate of the value of the output of African producers of crops for sale. So far as could be ascertained, these consisted, for the most part, of men who cultivated a crop, or crops, for sale on a piece of land that was additional to the traditional garden, or set of gardens, cultivated mainly by the woman of the family. An estimate of the number of economic producers was given by the Native Affairs Department in its annual employment returns. Their output was estimated by making the assumption that each economic producer in Western, Central and Southern Provinces cultivated 2 acres of economic crops and each in Barotseland and in Northern and Eastern Provinces cultivated 1 acre.<sup>2</sup> The pattern of cultivation in these extra acres was assumed (except where the pattern was known) to approximate to a much simplified form of the traditional garden with the same staples and the same main subsidiaries.

TABLE 20. Output of African agriculture

	Subsistence output ooo lb.	Economic output ooo lb.	Total output ooo lb.
1. Cereals (grain)	415,000	26,802	441,802
2. Pulses	150,500	1,965	152,465
3. Cassava (dry tuber)	181,300	17,617	284,517
4. Rootcrops and vegetables	85,600		
5. Cucurbits	120,500	—	120,500
6. Fruits and other foods	24,000	—	24,000
7. Other useful crops <sup>3</sup>	11,200	200	11,400

<sup>1</sup> The yields used for the four chief crops were the averages for native gardens, reported in the *Nutritional Review of the Natives of Nyasaland*, Nyasaland Government, 1938, p. 11. They were: maize 700-1,000 lbs. per acre; millet 400-600 lbs. per acre; cassava 900-12,00 lbs. per acre; and sweet potatoes 700-1,000 lbs. per acre. These results corresponded closely to the direct evidence available for Northern Rhodesia.

<sup>2</sup> This was additional to the production in which they assisted on the family garden.

<sup>3</sup> Includes tobacco, castor oil, fish poison, etc.



Table 20, above, gives the total estimated output of the various types of subsistence crops and of economic crops.

It is impossible to attribute any definite margin of error to the above estimates as they stand. Unless the official population estimates are seriously astray, it can be assumed that the margin of error is less than 50%, but until they can be checked with consumption estimates it is impossible to be more definite.

The next table represents an attempt to evaluate the quantities. The value of output is given by provinces instead of by crops, in order to give some idea of the geographical distribution of the income. Grain and cassava have been converted to meal by taking 50% of the quantities given above. They have then been evaluated as meal for the purposes of the following table.

TABLE 21. Value of output of African agriculture. First approximation

	Value of subsistence output £	Value of economic output £	Total value of output £
Western Province	195,000	29,100	224,100
Southern Province	193,000	50,000	243,000
Barotse Province	380,000	1,500	381,500
Northern Province	368,000	2,200	370,200
Eastern Province	267,000	5,300	272,300
Central Province	162,000	22,400	184,400
All Provinces	1,565,000	110,500	1,675,500

Part of the subsistence output, as calculated above, was in fact traded, because it formed a surplus. If we assume that 1% of the subsistence output was traded at organised markets for cash this gives a total trade of the value of about £126,000. By searching the departmental reports—in particular the Native Affairs Department's reports—for records of sales, and for estimates of sales, and by using these reports as a basis for an estimate of the value of African trade in agricultural products, a figure was reached which was in the region of £100,000. Since a great deal of trade would be unrecorded, it can be assumed that this estimate forms the lower limit to the value of trade. Moreover, unless the surplus of subsistence production was much greater than the evidence suggests, it does not seem likely that a figure of £126,000 would appreciably under-estimate the value of the trade in agricultural products by African producers. Hence, approaching the problem from the output side, it seems reasonable to accept £126,000 as an estimate of the value of this trade.

In making estimates for the income column, however, we have already made an approach to the value of economic output from the income angle. On p. 30, above, we estimated the net income of farmers from the production of agricultural crops for sale at £117,500.<sup>1</sup> This compares with the above estimate of £110,500. It was thus assumed that the value of economic

<sup>1</sup> This does not include the traded output of subsistence producers.

output was in the region of £114,000, but that the value of all traded output was higher—probably between £130,000 and £140,000.

The subsistence output cannot be checked from the income side. Indeed, it is very difficult to get any check at all on these estimates, although some confirmation or correction of their general order of magnitude may be obtained by comparing them with consumption estimates. Some qualitative check on the reliability of the total values, which were originally built up by finding the output for each agricultural area, can be obtained by comparing the results per head of the available rural population. To those who know the country sufficiently well to be able to make broad generalisations on the relative standards of living of people in different provinces, the table which follows may give a definite guide to the probable margins of error in the total results. The first column gives the value of total agricultural output<sup>1</sup> in each province, expressed as an average money value per head of the available rural population. Since real differences are obscured by a considerable range of variation in local prices an attempt is made in the second column to express the same results at Lusaka prices. This could only be done by using prices of maize or maize meal as a guide to price variations<sup>2</sup> in general.

	Value of output per head	Value of output per head at Lusaka prices
	£	£
Western Province	2.35	1.93
Southern Province	1.91	1.91
Barotse Province	1.61	1.93
Northern Province	1.23	1.92
Eastern Province	1.44	1.90
Central Province	2.10	1.95

These figures suggest that, if the calculations are roughly correct, there is relatively little variation in standards of living as between one province and another although there will be a wider range as between different districts. From what was known of the country this conclusion did not seem unreasonable, although the direction of the difference shown above between Southern Province and Central Province was unexpected. Nevertheless, it must be recognised that, since all the deductions from the Ecological Survey reports and all the calculations were the work of one investigator, this apparent uniformity in standards of living may be the result of a standard method of approach and an inability to assimilate and to make adequate allowance for variations in the evidence for different areas.

As a result of such checks as these,<sup>3</sup> the conclusion was reached that, unless the material which formed the basis of the estimates had been seriously

<sup>1</sup> Subsistence output and economic output.

<sup>2</sup> Pim gives average retail prices for these commodities in 1937 at Lusaka, Nakana, Fort Jameson, Abercorn and Mongu. This gave prices for the principal town in each district except Central Province, which was assumed to have a price level between that of Southern Province and that of Western Province, with a slight bias towards the former. See col. No. 145, Appendix III. As a method of correcting price variations this is very crude, but there is no alternative, and, indeed, the whole process of evaluation was similarly crude.

<sup>3</sup> An attempt to convert output to a calories-per-head basis for each province strengthened the conviction that these estimates do not seriously distort the truth.

misunderstood,<sup>1</sup> the total of £1,565,000 for the value of subsistence output, together with £114,000 for economic output, is within about 30% of the truth. To this must be added some estimate of the value of urban cultivation carried on in urban plots by the families of men employed or otherwise engaged in non-agricultural occupations, and also of the value of wild foods such as honey, caterpillars, white ants, and so on, which form a not inconsiderable addition to native diet, and which are even traded in some of the main markets. Pim gives some information on the size and number of urban smallholdings,<sup>2</sup> and both the Ecological Survey reports and Audrey Richards' study of part of Northern Province give some data on wild foods.<sup>3</sup> By means of some arbitrary assumptions and generalisations, this material yielded an estimate of £10,000 for the value of urban cultivation, and £12,000 for the value of native wild foods. This, when added to the above estimates for subsistence output and economic output, gives a total value of £1,701,000.

### 3. MANUFACTURE AND BUILDING.

#### (a) *African Industry.*

An attempt was made to estimate the value of output of African beer, of the fishing and salt industries, and of arts and crafts such as basketmaking, woodworking, ironworking, and so on. Here again, the data were extremely scanty and all that could be hoped in making such an estimate was to indicate the relative importance of these activities in the framework of total economic activity. The output of the fishing and salt industries has been estimated on the basis of a few figures of cash sales or estimates of total output appearing in the annual reports of the Native Affairs Departments, and other official publications of a general nature. Since there has been no attempt in the production of such reports to provide information on these industries for all districts, or even for all districts in which they are an important part of economic life, this evidence is a very flimsy basis for an estimate. For both fish and salt an average price of 1*d.* per lb. or £9 per ton was assumed to represent net value.

In estimating the value of beer-brewing and of African craftsmanship, it was necessary to form an opinion of the amount of labour put into these activities and the value of that labour. There was some information on beer-hall profits,<sup>4</sup> but, in general, these estimates had to be made on the same kind of evidence, and from the same largely qualitative sources, as were used in reaching an estimate for the value of wild foods. Moreover, it was necessary in estimating the value of African nets, baskets, woodwork, etc., to exclude such items as are definable as capital equipment. For example, nets are used in fishing and enter into the total value of fish caught. They were thus excluded from this calculation. Part of the ironwork and woodwork will assist in the production of crops, fish, game, etc., and part will be used

<sup>1</sup> This qualification is implied in all attempts to estimate margins of error in this enquiry.

<sup>2</sup> Col. No. 145.

<sup>3</sup> Audrey Richards, *Land, Labour and Diet in Northern Rhodesia*.

<sup>4</sup> e.g. in the Pim report, *op. cit.*

in domestic activities which have not been included in this calculation. Mats are presumably produced for consumption purposes only, and the whole value of their output should be included here. In fact, the total output of African arts and crafts was estimated at about double the figure given below for the net value not included in other industries entered elsewhere.

Table 22, below, gives the results of these calculations. They are subject to the same wide margin of error as the estimates in Table 21, above.

TABLE 22. Value of the output of African industry

	Quantity produced	Value of output £
Fishing	4,500 tons	40,000
Saltmaking	160 tons	1,400
Arts and crafts	—	28,000
Beer	—	30,000
		<hr/> £99,400 <hr/>

(b) *Secondary Industries.*

Some information on the output of secondary industries was available in the annual report of the Customs Department. The information was more definite, and more often quantitative, than was the case, for example, in estimates of the value of African industry. It was sufficient to determine the relative order of magnitude of this item, but it was not enough to eliminate a wide margin of error. Table 23, below, gives the result of these calculations. It is more likely to under-estimate than over-estimate. The value given is net value. The gross value (i.e. including the value of the raw materials and purchased services) was estimated to be in the region of £44,000.

TABLE 23. Value of the output of secondary industries

	Quantity produced	Net value of output £
Soap	500,000 lb.	2,500
Ready-made clothing	14,000 dozen garments	3,800
Tobacco (manufactured)	2,000 lb.	400
Lime	5,346,000 lb.	1,200
Other	—	13,000
		<hr/> £20,900 <hr/>

(c) *Forestry.*

The principal producer of timber in Northern Rhodesia in 1938 was the Zambesi Sawmills Company. Details of this company's output (but not of the price to the producer) are given in the annual report of the Department of Agriculture. Output of other timber was estimated on the basis of less direct estimates given in the Agricultural Department's report. Since the number of Europeans and Africans employed at the sawmills in 1938 was known,<sup>1</sup> it was possible to make estimates from the income side. This gave the basis for the following unbalanced account for the Zambesi Sawmills.

<sup>1</sup> It is given in the report of the Customs Department in the section on secondary industries.

TABLE 24. An unbalanced account for the Zambesi Sawmills

Income		Output	
	£		£
1. Europeans	50,000	5. Railway sleepers, f.o.r.	124,812
2. Africans	33,000	7. Parquet blocks, f.o.r.	12,203
3. Profits	25,000	8. Other manufactured, f.o.r.	35,477
4. Rent and interest	10,000	9. Timber in round	11,388
			<hr/> 183,880
		10. Less 25% for transport	45,970
			<hr/> 137,910
		11. Producer's price	137,910
		12. Less 10% for materials	13,800
			<hr/> 124,110
5. Net value of income	<u>£118,000</u>	13. Net value of output	<u>£124,110</u>

On balance, therefore, it seems probable that the net value of output did not fall below £121,000, or roughly two-thirds of the f.o.r. value of output. In Table 25, below, this proportion is applied to the estimated f.o.r. value of mining timbers, and furniture, and joinery. Firewood is estimated at 50% of its f.o.r. value.

TABLE 25. Net output of forestry

	Quantity cu. ft.	f.o.r. value £	Net value of output £
1. Zambesi Sawmills output	1,341,200	184,000	121,000
2. Mining timbers	300,000 <sup>1</sup>	39,000	26,000
3. Furniture and joinery	29,500 <sup>2</sup>	6,000	4,000
4. Firewood	10,000,000 <sup>3</sup>	26,000	13,000
	<hr/> 11,670,700	<hr/> £255,000	<hr/> £164,000
5. Total timber			

The total of £164,000 is more likely to under-estimate than over-estimate.

#### (d) Building.

There was no information available on the size of the building industry, except the Native Affairs Department's estimate of the number of man-months worked by Africans employed therein. Since it seemed unlikely that the income of Africans would constitute more than a third of the total net output of the building industry, the conclusion was reached that its net output would be at least £120,000, with the probable error being in the direction of under-estimation rather than over-estimation.

The value of native huts built during the year was put at about £56,000. This estimate was reached by making assumptions as to average life of a native hut in different areas,<sup>3</sup> and also as to its average value. For most districts the average life was put at four or five years and the average value at about 10s. This involved the assumption, in effect, that between a quarter and a fifth of the families built a hut worth 10s. every year. In the towns it

<sup>1</sup> Northern Forestry Division. As estimated in the Department of Agriculture report.

<sup>2</sup> It was estimated for the Northern Forestry Division that annual consumption of firewood, other than domestic consumption by rural natives, amounted to 6½ million cubic feet. This estimate of 10,000,000 is intended to represent total consumption of firewood.

<sup>3</sup> This, under conditions of shifting cultivation, depends on the agricultural system, and varies from place to place.

was assumed that a hut cost more effort to build and had a less ephemeral existence.<sup>1</sup>

#### 4. DISTRIBUTION.

Distribution was another industry for which there was a little unsystematically-recorded information. For Northern and Barotse Provinces, for example, the Native Affairs Report gave the numbers of European- or Indian-owned stores, of African-owned stores and shops. Odd pieces of information could be found on the number of distributive units for other provinces, and it was known that there were about 10 European butcheries. By combining all these pieces of information, and by generalising where there was no information on the basis of what data there were (weighted by such relevant factors as area, total population, volume of earnings, and so on), the conclusion was reached that there were between 975 and 1,300 European- or Indian-owned stores in the country—more probably about 1,200.<sup>2</sup> The number of African-owned stores was estimated at 200, and the number of African hawkers at 1,000, excluding a large and indefinite number of casual hawkers and pedlars.

Table 26, which follows, gives the results of these estimates combined with estimates of the average net value of output per unit.

TABLE 26. Net output of distribution. First approximation

	No.	Net value of output £
1. European- or Indian-owned stores or shops <sup>3</sup>	1,200	720,000
2. African-owned stores or shops	200	6,000
3. African hawkers	1,000	18,000 <sup>4</sup>
4. Total net output of distribution		<u>£744,000</u>

It is possible to check the first item in this table from the income side of the account. The income from trading of Europeans and Asiatics and of African employees, as estimated for the income column, amounts to about £610,000. Assuming that about 50% of the 'other foreign companies' in Table 10 are trading companies, and that rather more than 20% of the Northern Rhodesian companies whose income is calculated in that table are also trading companies, we get an addition for profits and interest of about £110,000. Rent and other charges probably do not exceed £60,000, giving a total of £780,000 for the net value of income earned from distribution conducted by European- or Indian-owned stores. This compares with £720,000 as estimated above.

Items 2 and 3 in the above table can be compared, less directly, with the estimate of earnings of other independent male workers.<sup>5</sup> In effect, items

<sup>1</sup> No attempt was made to impute an annual value to the native rural huts, which may be abandoned every 4 or 5 years as the village moves on, or even sooner, if the owner dies.

<sup>2</sup> For the preliminary estimates the conclusion was 1,100, but comments received since these were made suggest the higher figure of 1,200.

<sup>3</sup> Including African butcheries.

<sup>4</sup> Includes an allowance for casual hawking.

<sup>5</sup> See above, Table 12, item 2.

2 and 3 suggest that very little more than 10% of the earnings of those independent male workers engaged in non-agricultural economic production and distribution was due to distribution. This is less than might be expected, and on balance, it seems reasonable to assume that at least 15%, or about £32,000, was due to distribution. Table 27, below, shows a balanced account for distribution, drawn up on the basis of a comparison of income and output estimates.

TABLE 27. Distribution. A balanced account

Income		Output	
	£000		£000
1 European individuals	500	9 Net value of output of European- or Indian-owned stores or shops	750
2 Asiatic individuals	70	10 Net value of output of African-owned stores or shops	9
3 Foreign trading companies	30	11 Net value of hawking	23
4 Northern Rhodesian trading companies	70		
5 African employees	30		
6 Rent and other charges	50		
7 Africans working on their own account	32		
	<hr/>		<hr/>
8 Total net income from distribution	£782	12 Total net output of distribution	£782
	<hr/>		<hr/>

An examination of the margins of error in the above table (allowing for the tendency of some errors to cancel each other out) suggests that the margin of error in the total is probably not more than 20%.

### 5. TRANSPORT.

The principal transport company in Northern Rhodesia was Rhodesia Railways Ltd., a company which serves both Northern and Southern Rhodesia, and which has its headquarters in Southern Rhodesia. The Blue Book gave separate operating statistics for all but some 93 miles of Northern Rhodesian railroad. This 93 miles, which represented between 14% and 15% of the Northern Rhodesian track mileage, was included with a Southern Rhodesian section of the line, and it was allowed for in the estimates below by making a proportionate addition to the Northern Rhodesian statistics.

TABLE 28. Output of the Northern Rhodesian railway  
First approximation

	£	£
		1,299,000
1. Total receipts		
2 Less expenses paid out of operating surplus <sup>1</sup>	58,000	
3 Less imported railway materials	125,000	
4 Less locally purchased materials	12,000	
5 Less depreciation <sup>1</sup> and purchased services	60,000	
	<hr/>	
6. Total purchased materials and services and depreciation	255,000	
7 Total net taxable output		1,044,000
8. Less remittances abroad <sup>2</sup>	477,000	
9. Total net national output		567,000

<sup>1</sup> By analogy with other foreign companies, particularly mineral companies.

<sup>2</sup> i.e. operating surplus less expenses paid out of it. This item includes profits, distributed and undistributed, interest and transfers to reserves

This estimate can be compared with estimates reached from the income approach. A glance at Table 9, on p. 26, and Table 11, on p. 29, shows that the incomes of European and African employees have already been put at £375,000 and £87,000 respectively. After adding a percentage for other incomes, such as rent, we get a total for net income of about £482,000. This compares with the total of £567,000 for net output. The discrepancy is not surprising. A comparison of the estimates for European and African income derived from railways, with European and African income from mining or from government service, shows that the former appear relatively very low. Even if both are raised by 10%, the average paid by the railways still appears considerably lower than is the case for either the mines or the government. On the other side of the balance sheet, the estimate of imported materials is barely equivalent to the published figure for imports of railway materials, and it is more than likely that other imports were bought by the railway company which were not called 'railway materials' by the Customs Department.<sup>1</sup> Moreover, the weakest item in this table—the estimate for locally purchased materials—is very low and probably accounts for a substantial part of the discrepancy.

Table 29, below, gives a balanced account for the railway company, making the adjustments suggested by these conclusions.

TABLE 29. An account for the railways

Income		Output	
	£000		£000 £000
1. European employees	413	5. Total receipts	1,299
2. African employees	96	Less:	
3. Rent and other charges	20	6. Imported materials, depreciation and services	260
		7. Locally purchased materials	33
		8. Total purchased materials, services and depreciation	293
		9. Remittances abroad	477 <sup>a</sup>
		10. Total deductions from gross output	770
4. Net income from railways	£529	11. Net output of railways	£529

An examination of the margins of error in the items of the above table suggests for the total a margin of error of not more than 10%.

Motor transport, and carrier, or barge, transport were more difficult forms of activity to assess, however. Long distance freight transport was calculated by estimating the amount of goods to be carried and the average distances involved, together with the cost of carriage. Similarly, the value

<sup>1</sup> Imports of coal, for example.

<sup>a</sup> This item corresponds to item 4 in Table 10. See above, p. 27. It was obtained in the same way for both tables, so it has not been checked by the process of drawing up a balancing account.



of road passenger transport was approached through estimates of the number of passengers, average distances, and fares. The main sources of these estimates were the import and export lists, immigration figures, employment statistics, and the report of the Committee to Consider Means of Reducing Costs of Transport, 1938. Transport within the railway belt was assumed, by analogy with the proportion of the road maintenance allocation absorbed by its roads, to represent some 57% of the value of all the motor industry's output. Imported working materials used in commercial road transport were estimated as a proportion of the imports of motor spirits, motor parts and accessories, tyres and tubes, and lubricating oils, together with 70% of the imports of motor vans and trucks.<sup>1</sup> Estimates of the net value of barge transport, and of portorage, were also made, but these were subject to a very wide margin of error, since it was impossible to obtain precise information on the journeys of barges, or on the number of men engaged as porters. Table 30, below, gives the results of all these estimates.

TABLE 30. Net output of motor, river and carrier transport

	£	£
1. Long distance freight	66,000	
2. Long distance passengers	13,000	
3. Short distance transport <sup>2</sup>	103,000	
	<hr/>	
4. Gross output motor transport	182,000	
5. Less purchased materials, etc.	93,000	
6. Net output motor transport		89,000
7. Barge transport		7,000
8. Portorage		24,000
		<hr/>
9. Total motor, river and carrier transport		£120,000
		<hr/>

The margin of error in the above total is considerable, and must be put at about 40%. This gives a total net taxable value of all transport, including railways, of £1,126,000 with a margin of error of about 13%, and a net national value of £649,000, with a margin of error of about 16%.

## 6. MISCELLANEOUS SERVICES.

Under this heading are included government service, housing, personal services, professional and financial services. For most of these the output is not estimated independently from income, although their entry into this column involves some rearrangement of their constituent parts.

Table 31, which follows, gives the estimates for this miscellaneous category of services.

<sup>1</sup> This involved the assumption that 25% of imports constituted new investment in the motor industry, and 5% entered into the working equipment of other industries. The assumption as to new investment was derived from an inspection of the import list over a period of years, and a resultant estimate of the replacement rate.

<sup>2</sup> i.e. transport within the railway belt.

TABLE 31. Miscellaneous services

	European £000	African and Asiatic £000	Profits, interest, etc. £000	Total earnings £000
1. Government	434	58	269	761
2. Domestic; personal; entertainments	51	92	15	158
3. Professional and religious	115	22	—	137
4. Banking	25	4	3	32
5. Housing	335	159	—	494
6. Total miscellaneous	960	335	287	1,582

## NOTES ON THE ESTIMATES.

1. The value of the net output of government is the income of government employees and the government's profits from trading service and income from property or from abroad. It should also include debt service payments which go abroad.

2-3. These items consist of the relevant estimates in Table 9 and Table 11 as estimated for the income column above. The 'entertainments' item is residual.

4. This item is based on the number of bank branches and estimates of their average salary and wage bills.

5. The rents imputed to European housing rest on the assumption that each of 6,700 European earners enjoyed accommodation worth £50 per annum.<sup>1</sup> This may be high as a general average, but there was no means of checking it. African housing to which rents have been imputed includes only housing in urban areas. On the number and rent of African huts in urban areas some information was available in the Pim report<sup>2</sup> and elsewhere.<sup>3</sup> This information was generalised for cases where data were not available.

This completes the study of output in Northern Rhodesia and gives the material for an output column, and for a new version of the income column arising out of the cross-checks which can be carried out between the two columns. Table 36 gives a balanced account of national income and output and shows the interconnections between the two columns. A comparison of the income estimates in this table with earlier estimates produced in the first part of this chapter shows that it has been necessary to increase European incomes by the amount of the housing services enjoyed by them, to scale down company incomes, to increase the incomes of employed Africans, and to reduce the incomes of independent African producers. On balance there has been a slight reduction on the estimate for African incomes contained in Table 11. There is no check on the estimates for Asiatic incomes.

<sup>1</sup> A publication of H.M. Eastern African Trade and Information Office on *Settlement in Northern Rhodesia* gives rents ranging from £50 to £120 per annum, and averaging £90 for a three-roomed brick house, or £120 for a four-roomed brick house. Values would presumably be lower in country districts.

<sup>2</sup> Col. No. 145.

<sup>3</sup> Especially in *The Report on Labour Conditions in Northern Rhodesia*, by Major G. St. J. Orde Browne, Col. No. 150, 1938.

TABLE 32. National Income and Output. The Second Estimate.<sup>1</sup>  
(In thousands of pounds)

	Resident individuals	European incomes	Resident companies	African incomes	Asiatic incomes	Government incomes	Total taxable incomes	Total residents' incomes
	£000	£000	£000	Subsistence	Economic	£000	£000	£000
1. Mining	1,645	4,869	78	—	761	—	7,353	2,484
2. European farming	127	—	—	—	70	—	197	197
3. African agriculture	—	—	—	1,577	124	—	1,701	1,701
4. African animal products	—	—	—	89	74	—	163	163
5. African industry	—	—	—	70	29	—	99	99
6. Secondary industries	10	—	3	—	8	—	21	21
7. Forestry	60	—	54	10	40	—	164	164
8. Building	50	—	30	—	40	—	120	120
9. Distribution	500	30	120	—	62	—	782	752
10. Transport	448	477	53	—	148	—	1,126	649
11. Government	434	272	—	—	58	820 <sup>2</sup>	939	1,312 <sup>2</sup>
12. Domestic, personal, entertain- ments, etc.	51	—	15	—	92	—	158	158
13. Professional and religious	115	—	—	—	22	—	137	137
14. Banking	25	3	—	—	4	—	32	29
15. Housing	335	—	—	—	155	—	494	494
16. Income from abroad	18	—	—	—	81	—	99	99
17. Totals	£3,818	£5,651	£353	£1,746	£1,768	£820 <sup>2</sup>	£13,585	£8,579 <sup>2</sup>

<sup>1</sup> The second estimate completes the cross-checks between the independent income and output estimates.

<sup>2</sup> Contains £645,000 received from foreign companies' income tax. Unless foreign companies are excluded from the economy this appears as part of profits. When they are excluded—for the purposes of the residents' income definition—it constitutes government income.

## PART III. THE EXPENDITURE COLUMN AND THE BALANCE OF PAYMENTS.

Ideally, it should be possible to build up an independent estimate of national consumption and investment and of national expenditure and receipts from abroad. These independent calculations would then provide a full check not only on the totals already arrived at for national income and expenditure, but also on many of the individual items in the first two columns of the income-output-expenditure table. In practice, it was not possible to build up an expenditure table from completely independent sources for Northern Rhodesia, although there was much that was new and independent in the balance of payments.

## I. THE BALANCE OF PAYMENTS.

Two balances of international payments were constructed. One corresponded to the taxable definition of national income and accepted the foreign firms operating in the colony as part of the national economy. The other excluded the foreign firms and measured only the balance of payments between the residents of Northern Rhodesia and the outside world.<sup>1</sup>

Table 33, which follows, gives the taxable balance of payments. It will be seen that if these estimates were correct there was a gross import of capital into Northern Rhodesia of about £3,746,000. This conclusion is borne out by the fact that a large proportion of the imports into the colony consisted of industrial goods bought by the mining companies. These would be paid for by borrowing or by the realisation of the foreign capital assets of the companies, and thus appear in the international accounts as an import of capital.

TABLE 33. The taxable balance of payments

I. Income generated by receipts from abroad	£	£
1. Value of exports at border		
(a) Produced by Northern Rhodesians	463,400	
(b) Produced by foreign concerns	8,876,500	
(c) Total value of exports at border		9,339,900
2. Cash or goods remitted by emigrant labourers		95,000
3. Income from foreign property		18,200
4. Receipts from tourists		90,000
5. Receipts from foreign missions		66,000
6. Government receipts from abroad		39,600
7. Total income generated by receipts from abroad		£9,648,700
II. Current expenditure and investment abroad		
8. Value of imports at border		7,023,300
9. Value of imported services		
(a) Transport	477,000	
(b) Distribution and banking	33,000	
(c) Remittances abroad by emigrant labourers	14,000	
(d) Remittances abroad by mineral companies	4,869,000	
(e) Total value of imported services		5,393,000

<sup>1</sup> See above, pp. 14-19.

	£	£
10. Less government tax receipts from foreign companies		645,000
11. Government current expenditure abroad		
(a) Debt service	134,400	
(b) Pensions, gratuities, grants, travelling, etc.	137,400	
(c) Total government current expenditure abroad		271,800
12. Expenditure abroad by Northern Rhodesian residents		773,900
13. Government investment abroad		
(a) Transfer of balances and reserves	472,600	
(b) Increase in gold holding	49,300	
(c) Imports of coin from Southern Rhodesia	56,200	
(d) Total government investment abroad		578,100
14. Total current expenditure and investment abroad		<u>£13,395,100</u>

## NOTES ON THE ESTIMATES.

*(a) Imports and exports of merchandise.*

The task of constructing a balance of payments for Northern Rhodesia was made especially difficult by the way the trade statistics were reported. The Customs Department evaluated imports and exports (other than mineral exports) free on rail at place of despatch, and it was necessary to add the cost of transport to the Northern Rhodesian border in each case. The problem was further complicated by two factors. First, by the fact that mineral exports were valued at London market price, less a formal proportion for freight and insurance, which was obviously inadequate to cover all the charges involved in transporting the mineral from Northern Rhodesia to London. Second, by the fact that some imports whose ultimate place of origin was Europe or the U.S.A., or otherwise outside Africa, broke bulk in Africa, and were evaluated free on rail at places in the Union of South Africa or in Southern Rhodesia. It was possible to obtain information on the charges incurred in transporting the output of the four large mineral companies to the border from their annual reports. In the case of imports, the Customs Department distinguished the goods which were valued free on rail outside Africa, or at places in the Union, or at places in Southern Rhodesia. Thus it is probable that the estimate for the value of exports is fairly reliable, but there may be considerable errors in the estimate for the value of imports, which involved calculating transport costs on the basis of railway freight rates in Southern Rhodesia and the Union, or on the estimated proportion added to United Kingdom value.<sup>1</sup> The error in item 1 (c) of Table 32, above, is thought to be less than 5%, but the error in item 8 is about 12% and is probably due to overvaluation of imports.

*(b) Import and export of services.*

The largest export of services was the income generated by goods or cash received from, or brought by, Northern Rhodesian labourers who had gone

<sup>1</sup> I am indebted to the African Lakes Corporation for supplying figures of its imports into Northern Rhodesia in 1938, and of the values added by costs incurred during transit.

abroad to temporary employment. This was estimated, largely on the basis of Godfrey Wilson's findings in Broken Hill,<sup>1</sup> to be in the region of £1.75 per native so employed. Similar assumptions were made for immigrant labourers, and the net export of services on this account was estimated to amount to about £81,000.

A corresponding item for the European sector of the economy was the income estimated to have been remitted abroad by European residents in Northern Rhodesia. This temporarily resident population of Europeans maintains and educates families abroad, spends a large part of its salaries abroad on leave, and normally meets a considerable volume of annual commitments with—for example—United Kingdom insurance companies. Information on leave pay and gratuities was obtainable from government reports and from the mining companies' annual reports. In addition, there was an estimate made for Kenya in the *African Survey*<sup>2</sup> which gave a basis for estimate on the proportions sent to insurance companies and to similar channels. The margin of error in the estimate built up from this material is considerable, however, and must be assumed to lie between 40% and 50%.

Of the other items which come into the international trade in services some have already been estimated in previous sections of this chapter. The value of the remittances abroad of mineral, transport, distribution and banking companies has been calculated already in the relevant parts of the output section, and income received from abroad by Europeans has been entered amongst the earnings of European residents. Government transactions in the international sphere have been estimated from the government accounts and receipts from foreign missions from the *Interpretative Statistical Survey of the World Mission of the Christian Church*. Expenditure by foreign tourists was roughly calculated by estimating the probable average number of visitors in the colony throughout the year and their average expenditure.

On balance, it seems unlikely that income generated by receipts from abroad would fall below £9.6 million or that current expenditure and investment abroad would exceed £13.5 million. The estimate of the gross import of capital seems to have a margin of error in the region of 15%, however, and is more likely to prove an over-estimate than an under-estimate.

## 2. EUROPEAN EXPENDITURE.

An estimate of European expenditure was built up largely on the basis of import statistics, but also on the basis of a budget survey conducted in Southern Rhodesia. Import statistics were used in conjunction with the data in Appendix XVII of the Pim report<sup>3</sup> estimating the proportion of duty paid on each category of goods by Europeans. Where retail values were not available it was necessary to add an appropriate percentage for distribution and transport charges incurred after leaving the customs station. The budget

<sup>1</sup> In his *Essay on the Economics of De-tribalization in Northern Rhodesia*.

<sup>2</sup> See *An African Survey*, by Lord Hailey, 1938, pp. 1350-1.

<sup>3</sup> Op. cit. pp. 378-383.

enquiry which was used to fill in some of the gaps left in the estimates after the import statistics had been fully exploited was compiled by the Department of Statistics, Southern Rhodesia, and showed average household expenditure for a group of some 68 householders in the principal towns of Southern Rhodesia.<sup>1</sup> Its results were adjusted for the different size of family, and the different price level, prevailing in Northern Rhodesia. They were used cautiously, and with due regard for the difference in Northern Rhodesian conditions, and the resulting distortions are probably not serious. In any case, a large proportion of European expenditure went on imports or on expenditure abroad and so was independently estimated.

The results of these estimates are given below in Table 34.

TABLE 34. European consumption. First estimate

	£
1. Food, alcohol and tobacco	1,382,800
2. Clothing	251,400
3. Household expenses*	234,200
4. Rent and rates	350,000
5. Personal services	133,000
6. Other manufactured goods	410,000
7. Abroad	774,000
8. Other services	390,000
	<hr/>
	3,925,400
9. Direct taxes, fines, gifts	119,000
	<hr/>
10. Total	£4,044,400

In Table 34, above, the income of European residents (individuals and companies) has been estimated at about £4,171,000. This means that if the above expenditure estimates are correct the investment of Europeans amounts to about £127,000. A careful cross-checking of the individual items on the basis of the framework set up in Table 36, however, suggests that these results should be modified. The cross-checking process is illustrated in Tables 37-39.<sup>3</sup> The first of these tables shows the effect on the income and output estimates of the expenditure check. The second and third show for taxable incomes and residents' incomes respectively, the conclusions on the balance of payments, consumption and investment items. The final conclusions are given on p. 64, which shows the complete income-output-expenditure table for Northern Rhodesia's taxable national income, and on pp. 66-67, where the residents' income-output-expenditure table and the residents' balance of payments are drawn up.

### 3. AFRICAN AND ASIATICS EXPENDITURE.

An attempt was also made to draw up an independent table for the cash

<sup>1</sup> The group surveyed consisted mainly of mineworkers and civil servants, but included also a few railway workers, builders, bank clerks and persons engaged in commerce. The results were published monthly in *The Economic and Statistical Bulletin of Southern Rhodesia*. See especially Vol. X.

i.e. imported household goods, fuel and light, and servants.

See below pp. 61-62

expenditure of Africans and Asiatics.<sup>1</sup> The sources were again import statistics, and some miscellaneous data on African budgets. Imports which were not bought by Europeans or commercial companies were assumed to have been bought by Africans or Asiatics. From import statistics estimates could be built up of African and Asiatic expenditure on clothing and capital goods. Native tax receipts were recorded in the government's accounts. These three fairly reliable totals—expenditure on clothing, on capital goods and on taxes—were combined with appropriate data on the proportion of *native cash income going into each main channel of expenditure*. The family budget data which formed the basis of these estimates were obtainable from Godfrey Wilson's essay on Broken Hill<sup>2</sup> and from other sources.<sup>3</sup>

The results of these calculations are given below in Table 35.

TABLE 35. African expenditure. First estimate

	£
Food	544,000
Clothing	828,000
Capital goods	98,000
Rent	99,000
Other	39,000
	<hr/>
Total consumption	1,608,000
Tax	135,000
	<hr/>
	1,743,000
Investment	41,000
	<hr/>
	£1,784,000

These estimates, rough though they are, suggest that the estimates of African cash incomes have been over-optimistic, since African and Asiatic incomes together amount to about £1,842,000 in Table 36, as compared with the figure of £1,784,000 for total expenditure and investment given above. By cross-checking individual items a considerable modification was achieved in these estimates which are illustrated below in Tables 37 to 39.

#### 4. SUBSISTENCE CONSUMPTION.

It was possible also to make a rough estimate of the amount of food consumed by the African population, and so to check the estimates of African subsistence income which have already been made from the output approach. The consumption estimate was made on the assumption that the official ration scale for meal, pulses and relishes, vegetables and rootcrops, per adult working male, could be generalised as an average per productive unit for the whole colony and evaluated on the same price scale as was used for the output estimates. This gave a total native food consumption (excluding meat and

<sup>1</sup> No information was available on the expenditure of Asiatics, but unless their income was seriously underestimated (and this seemed improbable from the existing information on Asiatics and their rates of earnings), their purchasing power is not a potent factor in the economy, and they have been absorbed into the African estimates

<sup>2</sup> Op. cit.

<sup>3</sup> For example, Max Gluckman's *Economy of the Central Barotse Plain*, also published from the Rhodes-Livingstone Institute, 1941.



fish) worth £1,575,000 compared with the estimate obtained from output sources of £1,701,000. Since in any case the ration scale basis is probably higher than average—if only because it contains a larger proportion of pulses and relishes and other more valuable crops—it seems fairly certain that the output estimates have put the value of African food production too high. On the other hand, economic production<sup>1</sup> appeared, when the adjustments were being made to cash income on the basis of cash expenditure estimates, to have been underestimated in Table 36.

As a result of these conclusions the estimate of African subsistence income was reduced from £1,577,000 to £1,486,000. All these are rough estimates and are based on a scale of prices which may prove in practice irrelevant to the true situation. If, however, we neglect the price factor which is the most arbitrary feature of the estimate for subsistence income, it seems probable that the estimate given in Table 37 and the following final tables is within 20% of the truth.

#### 5. GOVERNMENT EXPENDITURE.

A government income and expenditure account was drawn up from the public accounts as follows:

TABLE 36. Government revenue and expenditure

Revenue		Expenditure		£000	£000
1. Direct taxes, fines, gifts	919	5. Total government expenditure			1,418
2. Indirect taxes	465	6. Less sale of goods and services to public at cost	75		
3. Income from property and profits from sale of goods and services	135	7. Less purchase of assets	270		
		8. Total net current expenditure on goods and services			1,073
		9. Expenditure on capital assets and budget surplus			446
4. Total revenue	<u>£1,519</u>	10. Total expenditure			<u>£1,519</u>

#### 6. OTHER EXPENDITURE.

This completed the independent entries which could be made for the expenditure column. African subsistence consumption of such articles as the products of native industry remained unchecked. European expenditure abroad and remittances abroad by foreign companies were formal entries corresponding to estimates already made for the income column. Indeed, it is difficult to see how these unchecked items could be independently estimated, even with relatively full information. Subsistence production, and consumption of African manufactures, could theoretically be checked against each other if there were independent sources of information on man-hours worked with output per man-hour and on consumption per head. In practice,

<sup>1</sup> i.e. production of crops for sale. It is assumed here that this means sale outside the rural community, and no account is taken of purely local trade, barter or otherwise.

it is unlikely that man-hours worked on particular tasks could be discovered for a subsistence economy. Expenditure abroad by foreigners or temporary residents cannot be measured at the channels of ultimate expenditure, as can be done for expenditure within the country, because these channels of ultimate expenditure are completely absorbed into the economic activities of another economy. Hence, where the spenders are actually foreigners, this item must be calculated as an income item, and not as expenditure. Where the spenders are temporary residents it may be possible to determine from family budget data how they spend their income, but it is not possible to reinforce these estimates by retail sales statistics.

#### PART IV. CONCLUSIONS.

Briefly, the method of constructing triple entry balancing national accounts breaks down in two places when applied to an economy such as that of Northern Rhodesia. In the first place, it is clearly impossible to make three separate and independent entries corresponding to the value of the economic activity of subsistence producers. It is at best possible to make two separate entries—one for the value of output and the other for the value of consumption. Even this double entry approach is based on a somewhat artificial distinction, since in a subsistence economy the line between production and consumption is necessarily blurred. Crops may be consumed straight from the garden, and the act of consumption is also an act of production, for which the most comprehensive statistical reporting system would not find two different sources of evidence.

In the second place, the fact that the colonial economy is dependent on outside sources to supply capital and labour for it to carry on its production, means that the economic activity carried on within the national borders supplies income to persons who are not part of the nation, as it is usually conceived. Hence, while the expenditure of persons within the national borders can be measured by means of a combination of budget data and sales statistics, the expenditure of persons living outside the economy cannot be separately calculated and entered. Their expenditure must be estimated from the same sources as their income. Their activities can thus be recorded by double entry only.

This difficulty applies especially to foreign property holders, whose only connection with the colonial economy is that they lend capital to it and draw income from it. It applies to a lesser extent to the temporarily resident European population, which—at least as far as the tropical African territories are concerned—is predominantly composed of persons who have no intention of making permanent homes in the colony.<sup>1</sup> These people are part of the nation in the sense that they, for a period of years, live, work and spend in the colony. It is thus in practice impossible to exclude them from the nation, as can reasonably be done for some purposes in the case of persons who do not live in the territory, but draw incomes from activities carried on therein. On the other hand, both because they spend a substantial proportion

<sup>1</sup> This argument applies also to such Asiatic immigrants who are temporarily resident.

of their incomes elsewhere, and because they enjoy a standard of living which is on a different level altogether to that of the true indigenous peoples of the region, the value of their activity and their purchasing power cannot be simply aggregated with that of the natives, if the national income calculation is to have any meaning.

In practice a compromise was adopted, as will be seen in the final tables.<sup>1</sup> The income of foreign property holders was excluded altogether in one view of the national income, and Tables 41 and 42 give a national income which is confined to the activities of residents. Further, in all the tables the income and expenditure of Europeans was distinguished from that of Africans.<sup>2</sup> In Table 40, for example, it would have meant little to have combined items 37 and 44 or items 38 and 45, to produce single entries for the value of personal consumption of food or clothing. So also, the income estimates were classified not according to profits, rents, interest, wages and salaries, as is normally done for the United Kingdom economy, but according to the group of persons by whom they were earned.

The tables which form the conclusion of this chapter are thus somewhat different in form from the tables which appear in the annual United Kingdom White Paper on national income. The United Kingdom design of accounts cannot be applied in its entirety. On the other hand, the cross-checks and adjustments which have been possible have reduced the estimated margin of error in the cash income to about 6%, and in the subsistence income to about 30%, giving a total margin of error of less than 10%. Since no estimate which has not been cross-checked could have given results with a margin of error of less than about 16%, this represents a considerable advance on the unchecked estimates.<sup>3</sup> Thus, although the cross-checking process was not as complete as could have been desired, it did result in the achievement of much more reliable results than would otherwise have been possible.

Of the tables which follow, the first three illustrate the cross-checking process. Table 37, which is to be compared with Table 32, shows the effect on the income and output estimates of checking them with the expenditure and balance of payments estimates made in Part IV of this chapter. Tables 38 and 39 show the same results from the point of view of international trade and expenditure. Tables 40, 41 and 42 give the results which we set out to find, in what seemed to be the most appropriate form. Whether this is in fact the most appropriate framework in which to set the statistical analysis of an economy such as that of Northern Rhodesia, is a problem which will have to be determined by trial and error in the actual practice of economic analysis and administration.

<sup>1</sup> See below, Tables 37 to 42.

<sup>2</sup> The expenditure of Asiatics would also have been separately distinguished if the material had justified it. In practice, there were not enough data to produce a reasonable guess, and the Asiatic section of the Northern Rhodesian economy was not important enough to warrant even a token guess.

<sup>3</sup> Once again it must be emphasised that the attempt to assess the margins of error in these calculations is a highly subjective process, and the apparently definite margins cited here are seldom more than indications of orders of magnitude.

TABLE 37. Income and output. After checking with expenditure estimates.

	European incomes			African incomes		Asiatic	Government	Total	Total
	Resident individuals	Foreigners	Resident companies	Subsistence	Economic	incomes	incomes	taxable	residents'
	£000	£000	£000	£000	£000	£000	£000	£000	incomes
1. Mining	1,645	4,869	78	—	701	—	—	7,353	2,484
2. European agriculture	127	—	—	—	70	—	—	197	197
3. African agriculture	—	—	—	—	154	—	—	1,640	1,640
4. African animal products	—	—	—	1,486	89	—	—	163	163
5. African industry	—	—	—	70	36	—	—	106	106
6. Secondary industries	—	—	—	—	8	—	—	21	21
7. Forestry and sawmilling	10	—	3	—	40	—	—	164	164
8. Building	60	—	54	10	40	—	—	100	100
9. Distribution	40	—	20	—	55	—	—	745	715
10. Transport	490	30	100	—	138	70	—	1,066	589
11. Government	418	477	33	—	58	—	175	939	1,312
12. Domestic, personal, etc.	434	272	15	—	102	—	—	168	168
13. Professional and religious	51	—	—	—	22	—	—	137	137
14. Banking	115	—	—	—	4	—	—	32	29
15. Housing	25	3	—	—	95	—	—	434	434
16. Income from abroad	335	—	—	—	81	4	—	99	99
17. Totals	£3,768	£5,651	£303	£1,655	£1,738	£74	£175	£13,364	£8,358

TABLE 38. Income, output and expenditure. The final cross-check. Taxable incomes.

	Total taxable incomes £000	Imports £000	Exports £000	Available domestically £000	Consumed By Europeans and Asiatics £000	Invested £000
1. Mining, agriculture, manufacture, building <sup>1</sup>	9,744	12,666	8,995	15,388	2,910	5,561
2. Distribution and transport <sup>2</sup>	1,811	597	345	1,171	370 <sup>4</sup>	446
3. Government	939	272	40	618	99	—
4. Miscellaneous services <sup>3</sup>	771	3	156	—645 <sup>5</sup>	—	—645 <sup>5</sup>
5. Income from abroad	99	—	99	—	—	—
6. Totals	13,364	12,803	9,635	16,532	3,379	5,362
7. Capital movements	—	—3,746	—578	—3,168	—	—3,168
8. Net totals	—	£9,057	£9,057	£13,364	£3,379	£2,194

<sup>1</sup> i.e. items 1-8 inclusive, in Table 37, p. 61.<sup>2</sup> i.e. items 9-10 inclusive, in Table 37.<sup>3</sup> i.e. items 12-15 inclusive, in Table 37.<sup>4</sup> This distinction between government services consumed by Europeans and government services consumed by Africans and Asiatics is made by equating Asiatic and African consumption to their estimated burden of taxation, and allocating the residue of government current expenditure to the European section of the population.<sup>5</sup> This is government income from foreign taxpayers. It is deducted here because items 1 and 2 of this table are calculated before payment of tax.

TABLE 39. Income, output and expenditure. The final cross-check. Residents' incomes

	Total residents' incomes £000	Imports £000	Exports £000	Available domestically £000	Consumed £000	Invested £000
1. Mining, agriculture, manufacture, building <sup>1</sup>	4,875	4,018	3,311	6,541	6,203	248
2. Distribution and transport <sup>2</sup>	1,304	—	345	627	759	—132
3. Government	1,312 <sup>4</sup>	—	685 <sup>4</sup>	612	612	—
4. Miscellaneous services <sup>3</sup>	768	—	156	—	—	—
5. Income from abroad	99	—	99	—	—	—
6. Totals	8,358	4,018	4,596	7,780	7,664	116
7. Capital movements	—	578 <sup>5</sup>	—	578	—	578
8. Net totals	£8,358	£4,596	£4,596	£8,358	£7,664	£694

<sup>1</sup> i.e. items 1-8, inclusive, in Table 37, p. 61.<sup>2</sup> i.e. items 9-10, inclusive, in Table, 37.<sup>3</sup> i.e. items 12-15, inclusive, in Table, 37.<sup>4</sup> Includes £645,000 received in tax from foreign companies.<sup>5</sup> Government foreign investment financed in part by balances, in part by home disinvestment.

TABLE 40. The income-output-expenditure table. Final estimate. Taxable income, Northern Rhodesia, 1938

Total taxable income	£000	£000	Total taxable output	£000	£000	Total taxable expenditure	£000	£000
<b>I. European incomes</b>								
1. Resident individuals	3,768		17. Mining	7,353		<b>X. Personal consumption:</b>		
2. Resident companies	303		18. European farming	197		<i>Europeans</i>		
3. Foreigners	5,051		19. African agriculture	1,640		37. Food, drink, and tobacco	1,383	
4. Total European incomes		9,722	20. African animal products	163		38. Clothing, footwear, etc.	251	
			21. Total net output of primary products		9,353	39. Household expenses	234	
						40. Rent and rates	350	
						41. Professional services	100	
						42. Other goods and services	694	
<b>II. African incomes</b>								
5. Employment	1,251		<b>VI. Net output of manufacture, building, etc.</b>					
6. Independent work	311		22. Forestry and saw-milling	164		43. Total personal consumption of Europeans	3,012	
7. Housing	95		23. Secondary industries	21		44. Food	2,119	
8. Income from abroad	81		24. African industry	106		45. Clothing	828	
9. Subsistence incomes	1,055		25. Building	100		46. Rent	99	
10. Total African incomes		3,393	26. Total net output of industry		391	47. Other consumption	224	
						48. Total personal consumption of Africans, etc.	3,270	
<b>III. Asiatic incomes</b>								
11. Trade	70		<b>VII. Net output of distribution and transport</b>					
12. Housing	4		27. Distribution	745		49. Total personal consumption at market prices	6,282	
13. Total Asiatic incomes		74	28. Transport	1,066		50. Less indirect taxes	465	
			29. Total net output of distribution and transport		1,811	51. Total personal consumption at factor cost		5,817

IV. <i>Government incomes</i>		IX. <i>Net output of miscellaneous services</i>		XI. <i>Government expenditure</i>	
14. From trade	135	30. Government	899	52. Net current government expenditure on goods and services	1,073
15. From abroad	40	31. Domestic, personal, etc.	168		
	175	32. Professional, banking and religious	169	XI. <i>Investment</i>	
	•	33. Housing	434	53. Private home investment	248
		34. Income from abroad	139 <sup>1</sup>	54. Government foreign investment	578
		35. Total net output of miscellaneous services	1,809	55. Less government home disinvestment	132
				56. Total investment	694
				XII. <i>Remittances abroad</i>	
				57. Expenditure abroad by residents	774
				58. Incomes paid abroad by government	272
				59. Incomes paid abroad by foreign companies	4,734
					5,780
16. Total taxable national income at factor cost	<u>£13,364</u>	36. Total taxable national output at factor cost	<u>£13,364</u>	60. Total taxable national expenditure at factor cost	<u>£13,364</u>

<sup>1</sup> Includes government income from abroad.



TABLE 41. The income-output-expenditure table. Final estimate. Residents' income, Northern Rhodesia, 1938

Net national income	£000	Net national output	£000	Net national expenditure	£000
1. European incomes	4,071	6. Net output of minerals	2,484	13. Personal consumption of Europeans	3,012
2. African incomes	3,393	7. Net output of agriculture	2,000	14. Personal consumption of Africans and Asiatics	3,270
3. Asiatic incomes	74	8. Net output of manufactures, building, etc.	391	15. Total personal consumption at market prices	6,282
4. Government incomes	820 <sup>1</sup>	9. Net output of distribution and transport	1,304	16. Less indirect taxes	405
		10. Net output of government services	627	17. Total personal consumption at factor cost	5,817
		11. Net output of other services	1,552 <sup>1</sup>	18. Net current government expenditure on goods and services	1,073
				19. Expenditure abroad by European residents	774
				20. Investment	604
5. Total net national income at factor cost	£8,358	12. Total net national output at factor cost	£8,358	21. Total net national expenditure at factor cost	£8,358

<sup>1</sup> Includes government income from abroad.

TABLE 42. The balance of payments. Final estimates. Northern Rhodesia, 1938.

Income generated by receipts from abroad		Taxable receipts £000	Residents' receipts £000	Current expenditure and investment abroad	Taxable payments £000	Residents' payments £000
1. Value of domestic exports at border		9,340	463	9. Value of retained imports at border	7,023	3,244
2. Sale of services to foreign companies		—	3,193	10. Expenditure abroad by residents	774	774
3. Net inward remittances of migrant labourers		81	81	11. Government import of services	272	—
4. Expenditure by tourists and missions		156	156	12. Net value of commercial import of services	4,734	—
5. Government receipts from abroad		40	685	13. Government foreign investment	578	578
6. Income from property abroad		18	18			
7. Foreigners' investment in Northern Rhodesia		3,746	—			
8. Total net income generated by receipts from abroad		<u>£13,381</u>	<u>£4,596</u>	14. Total net current expenditure and investment abroad	<u>£13,381</u>	<u>£4,596</u>

## CHAPTER IV

### THE NATIONAL INCOME OF NYASALAND

The enquiry into the national income of Nyasaland followed the same broad lines as the study for Northern Rhodesia. Independent estimates were made, so far as possible, of national income, output and expenditure. Each of the estimates was then reconsidered and adjusted in the light of its contribution to a complete picture of the national economy. Again the inter-connectedness of the economic system was fully exploited in order to confirm or correct estimates built up on inadequate data.

In many ways, the logical problems raised by the two adjacent colonies were similar. There was the same problem of measuring and of fitting into the national income framework an important volume of subsistence output. There was the same problem of defining the nation in the most appropriate way, and of calculating and illustrating the part played, in this predominantly African economy, by European companies registered abroad, or by European immigrants. The tables at the end of this chapter<sup>1</sup> are very similar in form (though strikingly different in content) to those already evolved for Northern Rhodesia. The similarity extends beyond the final presentation of the results to the methods of making the estimates and of handling the basic raw material.

In this chapter the process of construction of tables of national income, output and expenditure will be described in somewhat less detail than were the estimates for Northern Rhodesia. Where the explanations are briefest, the similarity in method is closest. It should be noted, however, that the methods are not always identical. The material available on the Nyasaland economy differed frequently from that available for Northern Rhodesia. Moreover, the two colonies, although adjacent, are not identical in economic structure. Since this enquiry is essentially experimental in nature, the differences in approach which have had to be adopted for different areas, in relation to similar problems, may be important and suggestive. To take one example, the agricultural estimates for Southern Province, Nyasaland, were calculated on a per hut basis, since the material lent itself more readily to this kind of treatment, while for Northern Rhodesia and for Northern Province, Nyasaland, output was thought of in terms of families (where the adult woman was regarded as the unit), or in 'productive units'.<sup>2</sup> Which of these two methods constitutes the most suitable approach to the calculation of output in a subsistence economy is a problem that can be determined only by reference to local circumstances and local needs. This is one of the problems which require reconsideration in the light of field surveys.

<sup>1</sup> See below, pp. 89-94.

<sup>2</sup> See above, pp. 39-40.

## PART I. INCOME.

## 1. EUROPEAN INCOMES.

The number of Europeans engaged in agriculture, commerce and trade, government service, missions and other occupations was estimated in part from the income tax and poll tax assessment returns,<sup>1</sup> and in part from the 1931 Census,<sup>2</sup> unless specific information was available for a particular occupation.<sup>3</sup> The Bell report<sup>4</sup> gives an income distribution table for 1937 assessed incomes, i.e. for those over £300 per annum. This formed the starting point for an estimate of income distribution and of total income in 1938.

TABLE 43. Income distribution of individual Europeans

Income group	Nos.	Average income £	Total earnings £
Under £300	112	270	30,240
£300-£800	800	575	460,000
£800-£1,000	109	850	92,650
£1,000-£1,600	59	1,150	67,850
Over £1,600	20	1,760	35,200
All incomes	<u>1,100</u>	<u>£624</u>	<u>£685,940</u>

For comparative purposes these totals are analysed in the following table according to income earned in each industrial group.

TABLE 44. Incomes earned by individual Europeans in different industries.

Industry or occupation	Numbers engaged	Average earnings £	Total earnings £
Agriculture	328	491	161,000
Commerce and trade	194	625	121,300
Civil servants	250	984	246,000
Missionaries	257	440	113,100
Miscellaneous	71	625	44,400
All industries and occupations	<u>1,100</u>	<u>£623</u>	<u>£685,800</u>

## 2. COMPANY INCOMES

These were estimated from income tax statistics, and then analysed according to different industries, primarily on the basis of data given in the Bell report on tax paid by companies in different industrial groups in 1937.<sup>5</sup> The estimates thus arrived at are given below.

<sup>1</sup> The tax returns classify adult males according to these categories, together with a group called 'company employees', who were allocated to the other groups in accordance with the percentage of tax paid by the companies in each group.

<sup>2</sup> The 1931 Census was used to estimate the proportions gainfully occupied.

<sup>3</sup> As for civil servants.

<sup>4</sup> Col. No. 152, *Report of the Commission appointed to Enquire into the Financial Position and Further Development of Nyasaland*. See especially pp. 261-2.

<sup>5</sup> Col. No. 152. In making the company estimates, it was necessary to estimate each industry's proportionate share of the total increase in incomes which took place since the year covered by the 1937 assessment.

TABLE 45. Incomes earned by companies

Companies	Incomes earned £
Tea and tobacco	174,000
Railways and shipping	111,000
Trading	35,000
Banking and insurance	7,000
Miscellaneous	1,000
	<u>£328,000</u>

## 3. ASIATIC INCOMES

In 1938-39, there were 1,127 Indians assessed to income tax or poll tax, and they paid an average tax of about £3 per head. It is probably reasonable to assume that this is roughly equivalent to the gainfully occupied Asiatic population, since it includes all adult males of 18 years and over. In 1937, there were 31 Indians earning over £300 per annum, and the distribution of these incomes is given in the Bell report.<sup>1</sup> So far as can be judged the pattern of income distribution for Asiatics in 1938 was as shown in the following table. Most of these people were engaged in trade, although there were a few in the service of the government.

TABLE 46. Incomes of Asiatics

Income group	Nos. in group	Average earnings £	Total earnings £
£24-£300	1,096	140 <sup>2</sup>	153,400
£300-£1,000	3	500	1,500
£1,100	3	1,100	3,300
£1,600	25	1,600	40,000
All groups	<u>1,127</u>	<u>£176</u>	<u>£198,200</u>

## 4. AFRICAN INCOMES.

The 1937 occupation census<sup>3</sup> resulted in the following estimates of the numbers of Nyasaland adult males engaged in each of the main activities. This formed a starting point for the attempt to estimate African incomes.

TABLE 47. Activities of adult male Africans

	Nos.
Wage earners in Nyasaland	48,800
Absentees	90,097
Growers of economic crops	170,646
Other economic production and distribution	2,840
Solely subsistence producers	131,139
Unfit	47,478
Total adult males	<u>491,000</u>

(a) *Wage earners in Nyasaland.*

It was clear from the 1930 labour census, which gave numbers enrolled

<sup>1</sup> Col. No. 152.

<sup>2</sup> The Labour Department reports that Asiatic wages ranged from about £24 to about £240 per annum, so this estimate may be high.

<sup>3</sup> Reported in Col. No. 152, which gives details for each province.

and numbers actually at work in January and August 1930, that there was a significant difference between the total number attached to any one occupation, and the average number earning throughout the year. The 1930 proportions of those at work to those enrolled for skilled labourers, unskilled labourers, and domestic servants, were used to adjust the Blue Book figures of Africans engaged in various occupations in 1938. The average annual wage, inclusive of food,<sup>1</sup> was estimated for each group from the Blue Book statistics of employment and wages.

These calculations gave rise to the following estimates of the earnings of Africans employed for wages in Nyasaland.

TABLE 48. African wages earned in Nyasaland

Occupation	Numbers enrolled	Estimated average number employed throughout the year	Average annual wage £	Total estimated earnings £
1. Public Works Department	3,800	2,900	6.3	18,300
2. Other government employment	3,000	2,800	12.6	35,300
3. Agricultural	46,000 <sup>2</sup>	36,600 <sup>2</sup>	4.2	153,700
4. Manufactures	1,500	1,200	6.0	7,200
5. Building	500	470	4.8	2,300
6. Railways	3,484	3,280	6.25	20,500
7. Domestic service	4,500	4,400	7.2	31,700
	<u>62,800<sup>2</sup></u>	<u>51,700<sup>2</sup></u>	<u>£5.2<sup>3</sup></u>	<u>£269,000</u>

(b) *Farmers' cash income.*

A considerable amount of information relating to the income of farmers from the marketing of economic crops was obtained from the Agricultural Department's annual reports. For the principal African cash crop—tobacco—there was also a specific report,<sup>4</sup> which made possible a fairly reliable estimate of the net return to the grower.

In the table which follows, the first two items are probably fairly reliable; the third and fourth items are based primarily on such information as recorded sales of groundnuts, rice, wheat, coffee, maize and European vegetables, or numbers of livestock slaughtered at recognised abattoirs, or recorded output of ghee or of hides and skins. They contain, however, a fairly considerable allowance for unrecorded sales or slaughterings. The last item is based on the assumption that each fisherman earned about £10 per annum from his fishing activities, exclusive of any earnings from hawking.<sup>5</sup>

<sup>1</sup> The value of food was estimated for cases where the Blue Book did not give the information.

<sup>2</sup> Inclusive of 7,000 Anguru immigrant labourers employed on tea estates. The figures for Nyasaland natives are 55,800 enrolled and 44,700 estimated at work throughout the year. This differs from the result obtained at the 1937 occupation census, but was thought to be more reliable as an estimate of those actually earning throughout the year.

<sup>3</sup> The average annual earnings per head of all those enrolled as labourers during the year is in the region of £4.3.

<sup>4</sup> 'Report on the Tobacco Industry', 1939.

<sup>5</sup> The number of fishermen was estimated from information in the report of 1931 Census to be about 2,000. According to the census report, about 10,000 were engaged in the fishing industry, of which the great majority were hawkers.

It is, therefore, a very rough guess at the probable order of magnitude of the fishermen's earnings.

TABLE 49. Farmers' and fishermen's cash earnings

Product	Number estimated engaged <sup>1</sup>	Estimated net value of return to producer £
1. Tobacco	68,000	121,700
2. Cotton	57,100	73,200
3. Other crops	15,000	14,000
4. Animal products	—	19,700
5. Fish	2,000	20,000
6. Totals	<u>142,100</u>	<u>£248,600</u>

(c) *Independent earners.*

These are given as about 2,840 in number in the 1937 occupation census. To this estimate has been added about 8,000 hawkers of fish, making about 10,840 in all. The 2,840 are assumed to be full-time earners and were estimated (on the basis of rates of earnings suggested in the Census report as typical for tailors, carpenters and similar independent workers) to earn an average of about £30 per annum. The hawker of fish on the other hand, is a part-time worker, and was estimated to earn only £1.75 per annum on the basis of the information on earnings in the Census report. The total earnings for independent workers was thus estimated at £99,200.

(d) *Migrant labourers.*

A large number of Nyasaland natives worked abroad for wages. The Blue Book gives a total of £54,454 remitted from the Union of South Africa, in the form of postal orders, or money orders, paid in Nyasaland. On the assumption that the European share of these remittances was about the same as the amount of European remittances from the United Kingdom, this left African remittances of about £53,230, or about £3.82 per Nyasaland adult male employed for wages in South Africa. In 1937, according to the Bell report,<sup>2</sup> Northern Province labourers in South Africa and Rhodesia sent £48,100 home, or, for 62,740 workers away, about £0.768 per head. West Nyasa headed the list with an average of £1.92 per migrant labourer and, significantly enough, had a relatively high proportion of emigrants in the Union. On the assumption that all migrants to South Africa sent £3.82 during the year, and that the remainder (excluding those reported to have been absent from Nyasaland since 1930) sent an average of £0.5 per head,<sup>3</sup> a total of

<sup>1</sup> These figures could not be complete in view of the scarcity of data, but are given wherever estimates are possible, in order to give some idea of the distribution of this cash income. The total of those engaged in growing economic crops was given in the Bell report. (See above, p. 70.) It does not allow for women so engaged, nor do the detailed estimates allow for overlap where there are producers of more than one economic crop.

<sup>2</sup> Col. No. 152, p. 99.

<sup>3</sup> A report on migrant labour published in Nyasaland in 1935, giving answers to questionnaires sent to the various districts, suggests that 10s. was a fairly common annual remittance. Certainly it seldom fell below 10s., judging by the answers given.

£83,200 was received in Nyasaland from emigrant labourers. Deducting £5,000 for the outward flow of remittances, particularly the remittances of Anguru labourers employed on tea estates, we get a net inward flow of about £78,200.

We now have the material for a first estimate of the national taxable income of Nyasaland—excluding the value of subsistence output.

TABLE 50. The taxable income of Nyasaland.<sup>1</sup> A first approximation

	£	£
I. <i>European earnings</i>		
1. Individuals	685,900	
2. Companies	328,000	
3. Incomes paid to foreigners	291,000	
4. Total European earnings		1,304,900
II. <i>Asiatic earnings</i>		
5. Total earnings of Asiatics		198,000
III. <i>African incomes</i>		
6. Wage earners in Nyasaland	269,200	
7. Migrant labourers	78,200	
8. Farmers and fishermen	248,600	
9. Independent workers	99,200	
10. Total African incomes		695,200
IV. <i>Government income</i> <sup>2</sup>		
11. From sale of goods and services	201,000	
12. Taxes from abroad	14,000	
13. Gifts from H.M. Government	147,000	
14. Total government income		362,000
15. Total taxable incomes <sup>1</sup>		£2,560,100

The error in this total appeared to be not more than 10%, after allowing for the tendency of some of the errors in the individual items to cancel each other out.

## PART II. OUTPUT.

### I. EUROPEAN AGRICULTURE.

Information on the quantities produced, and the export value, of the great bulk of European-produced crops, was obtained from the Department of Agriculture's annual reports. Their total export value, excluding milk and crops consumed off the farm, was between £575,000 and £580,000. The largest item was tea, whose net value to the grower was estimated to fall between two points—one found by deducting the estimated value of materials, implements and purchased services from export value, and the other by building up a total for the returns to land, labour and capital engaged in the industry.<sup>3</sup> The resultant estimate was conservative and has an error of about 15%. For tobacco, the report of the official commission which enquired into

<sup>1</sup> Excluding subsistence income.

<sup>2</sup> From the public accounts. See below, p. 85, for an analysis of the government's accounts.

<sup>3</sup> The relevant information on the tea industry was found largely in the Bell report, Col. No. 152.



the industry in 1938-39,<sup>1</sup> was used to support estimates of the costs of production involved in producing tobacco as far as the auction floor. Auction prices were derived from price data in the Department of Agriculture's reports. For other crops where the net price to grower was not known, an estimated percentage of the export value was deducted for purchased materials and services. The output of European dairy produce was crudely estimated on the assumption that 25% of the European-owned cows and heifers yielded an average of about 400 gallons per annum, and that the farmer's net return amounted to about one-third of the retail price at Blantyre.

TABLE 51. Net output of European agriculture

	Quantity produced	Estimated net value of output
		£
Tobacco	2,918,720 lbs.	57,500
Tea	10,857,952 lbs.	344,000
Cotton	126 tons	1,000
Coffee	430 cwts.	700
Sisal	10,640 cwts.	4,500
Rubber	154,464 lbs.	2,300
Soya beans	476,956 lbs.	600
Minor crops	—	3,600
Subsistence crops	—	2,000
Total crops	—	416,200
Milk	800,000 galls.	23,300
		<u>£439,500</u>

It thus seemed likely, on the basis of all these calculations, that the net value of the output of European agriculture was about £440,000, and that this estimate had a tendency to err on the side of underestimate. By summing incomes derived from agricultural occupations, as estimated in Part I, however, a total of £488,000 was reached for the net value of European agricultural output. This estimate seemed, on the whole, to be generous, especially in relation to company profits, but there was no reason to regard it as either more or less reliable than the output estimate. Hence the following account was drawn up for the industry.

TABLE 52. Account for European agriculture

Incomes	£000	Output	£000
1. European individuals	161	6. Value of net output of European agriculture	464
2. Nyasaland Africans	124		
3. Alien Africans	29		
4. Profits of companies and other charges	<u>150</u>		
5. Total incomes from agriculture	<u>£464</u>	7. Total net output of agriculture	<u>£464</u>

## 2. AFRICAN AGRICULTURE.

For Nyasaland, as for Northern Rhodesia, the data available for an estimate of the amount and value of native agriculture were inadequate to permit any but the most conjectural results. Two agricultural surveys had

<sup>1</sup> *Report of a Commission Appointed to Enquire into the Tobacco Industry of Nyasaland, Zomba, 1939.*

been made for Nyasaland, one dealing with the five northerly districts and one with Central Nyasaland. Of these, the first gave a more detailed account and was presented in a form which facilitated quantitative interpretation more readily than the latter. In effect, this meant that there was a considerable amount of detailed information on Northern Province, enough to make it possible to examine each district separately, but that only the most general data existed for Southern Province.

An elaborate estimate was therefore prepared for Northern Province.<sup>1</sup> Each district was divided into agricultural districts, a standard yield was arrived at and adjusted by 1938 harvest reports, and the estimated average acreage was correlated with the number of productive units<sup>2</sup> estimated to be available in each area. For Southern Province a much simpler approach had to be adopted and the results were correspondingly less detailed. They were reached by estimating average acreage cultivated per hut,<sup>3</sup> and the average percentage under each of a few main crops.

It is not necessarily the case, however, that the more elaborate method used for Northern Province produced more accurate results. In fact, it increased the number of arbitrary assumptions which had to be made in placing qualitative interpretations on quantitative data. The resulting estimates were more detailed, and made allowances for local variations in agricultural practice, but they shared the same deficiencies as the estimates for Southern Province, in that they were based on data completely lacking in statistical precision. Indeed, for the general purposes of national income calculation, and unless there is more information available than was the case for Northern Province, Nyasaland, it is very doubtful whether the more elaborate method is worth using at all.

An alternative method of approach to the problem of African agricultural output is to generalise the results of a small representative survey.<sup>4</sup> One of the reasons for undertaking the enquiry into Nyasaland was that it was possible to check an estimate reached by deductions from an agricultural survey with another estimate reached by generalising a local survey. This survey, which was undertaken in 1938-39 by a team under the direction of Dr. B. S. Platt,<sup>5</sup> resulted in the production of very detailed and accurate

<sup>1</sup> On the lines described above in Chapter 3 for Northern Rhodesia. See pp. 38-44. Neither of the two Nyasaland agricultural surveys provided as much suitable data for this purpose as did the Northern Rhodesia Ecological Survey, however.

<sup>2</sup> A productive unit was assumed to be equivalent to any adult over 15 and to 2 children between the ages of 5 and 15.

<sup>3</sup> This was put at about 2½ acres.

<sup>4</sup> It is necessary, of course, to have a detailed agricultural survey of the whole territory before it is possible to make any kind of judgment on whether or not the small survey covers a representative area.

<sup>5</sup> I am most grateful to Dr. Platt for making the agricultural material of the unfinished report of this survey accessible to me, and for discussing it with me. It contained a vast amount of data on such subjects as productive efficiency of men and women at different tasks, on yields, on such inter-native transactions as marriage payments, and on many other vital subjects—all of which was very suggestive material for a national income investigator to work on. The value to national income investigations of such surveys as this is very great. Not only does it provide systematic and accurate statistical records in a desert of uncertain and unreliable oddments of information, it provides a balanced picture of the peculiar economic structure of a primitive, little-known, community. Such a reliable picture cannot be obtained by more cursory methods of examination, even when undertaken on the spot, and is of immense value to the enquirer who is unacquainted with the territory.

records of output, consumption and trade for three differently situated villages.<sup>1</sup>

Since Dr. Platt's survey, although it covers three different communities, is not a fully representative survey, even for Kota Kota district, still less for the whole of Northern Province, the results of generalising his findings do not take into account variations in agricultural practice in different districts. On the other hand, the generalisation derives originally from accurate statistical records. Thus, on two fairly reasonable assumptions—(a) that average crop distributions and yields are not subject to any very considerable variation in Northern Province, and (b) that the survey villages are broadly typical—these detailed local results form a more satisfactory basis for estimate than the imprecise and haphazard data available in agricultural survey reports and other official publications.

The results of the comparison of the results obtained by the two methods were interesting. The agricultural survey method covered a much greater range of crops, but for similar crops it consistently under-estimated total yield. This, it seemed, was largely due to an under-estimate of the acreages cultivated. Unfortunately, the agricultural survey did not permit of sufficiently definite or precise results to make this check conclusive, but it seemed clear that there was an error of not less than 30% and not more than 50% in the original estimates. The final estimate which was adopted for Northern Province after a consideration of both approaches was a conservative one, and it is likely that it under-estimated the total output of the staple crops.<sup>2</sup> It was, of course, very difficult to attribute a margin of error to any

TABLE 53. Output of African agriculture

	Northern Province output ooo lb.	Southern Province output ooo lb.	Nyasaland output ooo lb.	Value £
Grain	404,367	379,144	783,508	1,044,700
Cassava and sweet potatoes <sup>3</sup>	169,069	25,564	194,633	202,700
Pulses	26,700	29,880	56,580	132,000
Rice <sup>4</sup>	1,120	10,500	11,620	29,100
Sugar Cane	1,878	—	1,878	7,800
Bananas <sup>5</sup>	13,518	1,134	14,652	30,500
Cucurbits	31,536	28,900	60,436	25,200
Vegetables and fruit	10,560	14,286	24,846	51,800
Tobacco	—	—	15,013	123,700 <sup>6</sup>
Cotton	—	—	16,072	76,200 <sup>6</sup>
Meat	—	—	1,956	23,100
Dairy products	—	—	1,586,250 galls.	6,600
Fish	—	—	—	20,000
Total				<u>£1,773,400</u>

<sup>1</sup> They were a hill village, a foothill village, and a lake shore village.

<sup>2</sup> This conclusion was borne out by the check carried out in Part III, Section 2 of this paper. See below, p. 83. In effect, the estimate for native subsistence output, adopted for the fundamental tables at the end of this chapter, involved an increase in the region of nearly 15% on the estimates arrived at from the output approach alone.

<sup>3</sup> Dry tubers.

<sup>4</sup> Hulled.

<sup>5</sup> Meal.

<sup>6</sup> Including a small allowance for subsistence output.

of the African agriculture estimates, but it seemed probable that the error in the final totals for grain, rootcrops, pulses, etc., considered as groups of products, was between 20% and 30%.

The results of these calculations for Northern Province and Southern Province are given separately above. They were not evaluated by the complex price system which was adopted for Northern Rhodesia. The prices were collected from Agricultural Department reports and similar sources. Hence they may tend to over-estimate actual values for the remoter districts, but this source of error did not seem likely to be very significant.

### 3. DISTRIBUTION.

A number of different publications were studied in order to find the number of European, Indian and African distributive units. They included the Handbook, the Blue Book, the *Rhodesia Nyasaland Year Book*, and similar annuals. On the basis of an accumulation of information from these sources, considered together with data on the trading tax,<sup>1</sup> estimates were formed of the number in each group. These calculations yielded the results given below. The average net output per unit was estimated on the basis of the probable staff, profits, rents, and other charges.

TABLE 54. Output of distribution

	Estimated Numbers	Estimated total net value of output £
General traders	10	27,000
European stores and branches	140	171,000
Asiatic stores	1,200	300,000
African stores	300	12,000
Hawkers <sup>2</sup>	10,150	24,700
		<u>£534,700</u>

For the European and Asiatic section of the distributive industry it was possible to conduct some kind of check with the estimates already made for income. These gave a total of about £381,000 for European and Asiatic incomes earned in distribution compared with £498,000 above. The biggest discrepancy concerned Asiatic traders who were estimated to receive net incomes of £198,000 compared with the above estimate of £300,000. On balance, it seems likely that the income estimates are more reliable, and the following account was drawn up for distribution.

TABLE 55. An account for European and Asiatic distribution

Incomes	£000	Output	£000
1. European individuals	125	6. Net output of European stores	185
2. African employees	30	7. Net output of Asiatic stores	215
3. Asiatic individuals	200		
4. Companies' profits	45		
5. Total incomes from distribution	<u>£400</u>	8. Total net output of distribution	<u>£400</u>

<sup>1</sup> It yielded £14,025 11s. 3d. in 1938.

<sup>2</sup> Based on the assumption that there were 150 full-time hawkers earning £30 per annum, and about 10,000 earning £10 per annum.

## 4. TRANSPORT.

It was estimated on the basis of railway operating statistics for 1938 that the net output of the railways was about £150,000, of which about £56,000 flowed abroad in interest, profits or charges incurred outside Nyasaland. This included lake transport run by the railway company. Road transport was calculated on the basis of the traffic in goods and passengers flowing in and out of the colony, as recorded in the Blue Book. Information on rates, prices, and costs of production were obtainable from the Bell report,<sup>1</sup> particularly from the section on government transport. The value of internal road transport was calculated on the assumption that the government carries half the internal trade in goods.

In all, the calculations for road, rail, lake and river transport worked out at about £195,000, distributed as follows:

TABLE 56. Output of transport

Roads	£ 38,000
Railways	150,000
River and lake	3,200
Porterage	3,300
	<hr/> £194,500

These were compared with the estimates for the income column, which worked out at about £188,000. On balance it seemed probable that the output estimates were not too low, and the account for the industry was therefore worked out as follows—the difference for the income column being an addition of £7,000 to the item 'other companies'.

TABLE 57. An account for transport

Income	£000	Output	£000
1. Railway and shipping companies	111	8. Value of net output of transport	195
2. Other companies	8		
3. Africans, railway employees	21		
4. Africans, other employees	5		
5. Africans, independent	15		
6. European individuals	35		
	<hr/>		<hr/>
7. Total incomes	£195	9. Total net output	£195
	<hr/>		<hr/>

## 5. MISSIONS.

Missionary activity made an important contribution to the national income of Nyasaland. The estimate of net output was based on information relating to the relative expenditure of the missions on various services—educational, medical, and other—which could be deduced from the Blue Book<sup>2</sup> and the Bell report.<sup>3</sup> It was confirmed by information derived from publications

<sup>1</sup> Col. No. 152. Especially pp. 225-6.

<sup>2</sup> The Blue Book gives total mission expenditure on education and government grants for all services.

<sup>3</sup> Bell gives government expenditure on hospitals, dispensaries and leper colonies, and numbers of government and mission medical units of various kinds.

dealing specifically with missionary activities.<sup>1</sup> The conclusions were that the missions spent a total of £72,400 on education, £19,600 on medical services and £13,900 on other services. Of this about £15,000 was obtained by government grant, £13,000 represented local contributions to missionary funds in the shape of education fees, subscriptions, etc., and the remainder came from abroad. To obtain the net output of missions, it was necessary to deduct expenditure on purchased materials and services and these were estimated to consist largely of imports, valued altogether at £13,000. Thus the net output of missions was estimated at £93,000. The value of European and African incomes from missions has already been estimated at £123,000, however. Thus the following account was drawn up for the Nyasaland missions.

TABLE 58. An account for the missions

Incomes	£000	Output	£000
1. European incomes	98	4. Net output of missions	108
2. African incomes	10		
	<hr/>		<hr/>
2. Total incomes	£108	5. Total output	£108
	<hr/>		<hr/>

#### 6. GOVERNMENT SERVICES.

The net output of government was deduced from the public accounts. The following table gives the income and output account.

TABLE 59. An account for government<sup>2</sup>

Incomes	£000	Output	£000
1. European government employees	205	9. Net output of government services	462
2. African government employees	54	10. Government income from abroad	161
3. Asiatic government employees	2	11. Incomes paid abroad	291
4. Income from property in Nyasaland	201		
5. Grants from abroad	147		
6. Taxation from abroad	14		
7. Pensions, interest, etc., paid to persons abroad	291		
	<hr/>		<hr/>
8. Total incomes from government service	£914	12. Total net output of government	£914
	<hr/>		<hr/>

#### 7. MISCELLANEOUS GOODS AND SERVICES.

Finally, there was a group of miscellaneous goods and services produced in Nyasaland on a small scale. The net output of banks and hotels was calculated as a function of the numbers of banks or hotels of various sizes. The output of the two soap factories was calculated from information in the Blue Book. Tea and cotton-ginning factories' output was included in the value of cotton and tea. Building was calculated partly from imports of build-

<sup>1</sup> Especially *Data on the Distribution of the Missionary Enterprise*, by M. Searle Bates. International Missionary Council, 1943. Also *Spearhead of Africa's Advance*, by A. G. Blood, a review of the work of the Universities Mission to Central Africa in 1943.

<sup>2</sup> Includes central and local government.

ing materials and partly from an estimate of the actual value of total output of residential and commercial construction.

The value of current housing services were estimated to total about £161,000, on the assumption that European housing was worth in all about £39,000 per annum, and that African housing was of an average annual value of about 3s. 6d. per hut.<sup>1</sup> These estimates, together with estimates of independent Africans' contribution to the net output of distribution, transport and miscellaneous goods and services, and also with African output of domestic service, were compared with the corresponding estimates for income. There was a considerable discrepancy between the two estimates, which could be accounted for by a tendency to under-estimate for the income column the value of goods and services independently produced by Africans, or by European individuals, and the profits of miscellaneous companies. The results of this decision, and of the corresponding adjustments to the estimates, are set out in the following table.

TABLE 60. An account for the miscellaneous section of output

Incomes	£000	Output	£000
1. Independent Africans	120	8. African hawkers and store-keepers	45
2. Miscellaneous African incomes	24	9. African transport	15
3. African incomes from manufacture and building	9	10. Other African goods and services	60
4. Miscellaneous company incomes	9	11. Banking and insurance	19
5. Banking and insurance companies profits	10	12. Factories	18
6. Miscellaneous European incomes	40	13. Building	23
		14. Hotels	18
		15. Professional occupations	14
7. Total miscellaneous incomes	£212	16. Total miscellaneous output	£212

As a result of these calculations, the following estimate was formed of the taxable output of Nyasaland. It includes subsistence output to the estimated value of about £1,621,000, of which about £1,500,000 represents food. It thus represents in effect very little change in the income estimates given at the end of Part I of this chapter. Although the extent of the change is not large, it is not possible substantially to reduce the margin of error in the total. All that can be done is to confirm the original conclusion that the margin of error in the estimate of cash incomes does not exceed 10% even on a conservative estimate. For the subsistence section the margin of error is considerable, however. In all it amounts to not less than 50%. The margin of error in the total is thus in the region of about 25% at least.

<sup>1</sup> The value of native housing was deduced from data given in Dr. Platt's unpublished report, and on the assumption that each hut lasts 5 years and costs effort and materials worth about 1s. to repair annually. As in the calculations for Northern Rhodesia, no attempt was made to give an imputed annual value, because native housing is too impermanent to be regarded as an investment. The Blue Book gives the number of native huts. Here, as for all population estimates used in this chapter, an upward adjustment was made on the assumption (derived from information collected at a later census) that the Blue Book underestimated the 1938 population by between 14% and 15%.

TABLE 61. Net taxable output after checking with income estimates

	£000	£000
I. <i>Agriculture</i>		
1. Net output of European agriculture	464	
2. Net output of African agriculture	1,748 <sup>1</sup>	
3. Total net output of agriculture		2,212
II. <i>Distribution and transport</i>		
4. Net output of distribution	445	
5. Net output of transport	210	
6. Total net output of distribution and transport		655
III. <i>Government and missions</i>		
7. Net output of government <sup>2</sup>	767	
8. Net output of transport	108	
9. Total net output of government and missions		875
IV. <i>Miscellaneous goods and services</i>		
10. Banking and insurance	19	
11. Factories	18	
12. Building	23	
13. Hotels	18	
14. Professions	14	
15. Miscellaneous output of Africans	60	
16. Total net output of miscellaneous goods and services		152
V. <i>Income from abroad</i>		
17. Government	147	
18. African	78	
19. Total net income from abroad		225
20. Total net taxable output		£4,119 <sup>1</sup>

### PART III. THE EXPENDITURE COLUMN AND THE BALANCE OF PAYMENTS.

#### 1. EUROPEAN EXPENDITURE.

The problem of estimating the value of the various items of European expenditure was approached for Nyasaland in the same way as for Northern Rhodesia. A careful analysis was made of import statistics in relation to the groups by which they were estimated to have been consumed—European, African or Asiatic. Unless it was possible to evaluate quantities imported at retail prices, on the data given in the Blue Book, a percentage was added to the c.i.f., plus duty value to allow for costs of distribution and transport within Nyasaland. Secondly, the family budget analysis made for Southern Rhodesia, and used already in the Northern Rhodesian estimates, was adapted for differences in Nyasaland conditions. Thirdly, a collection was

<sup>1</sup> Including subsistence output.

<sup>2</sup> Excluding government income from abroad. See item 17.



made of specific data on particular items of consumption.<sup>1</sup> The final estimate was the result of a combination of all these data, to form what seemed to be the most likely pattern of European expenditure.

TABLE 62. Disposal of European income

	£
1. Food	100,000
2. Clothing and footwear	30,000
3. Rent and rates	44,000
4. Alcohol and tobacco	60,000
5. Servants	23,000
6. Household expenditure	32,000
7. Expenditure abroad	147,000
8. Other expenditure	170,000
9. Total current expenditure	606,000
10. Investment	55,000
11. Total current expenditure and investment	661,000
12. Direct taxes	12,000
13. Total income disbursed	£673,000

This compares with a total of about £728,000 estimated to be at the disposal of Europeans in Nyasaland, either through individual earnings or through the earnings of local companies. The income and output estimates which produced this total were therefore re-examined, and it seemed possible to reduce the estimates for the value of European agriculture (and the European income therefrom), and the value of European distribution (and the European income therefrom). The following income and outlay account was therefore reached.

TABLE 63. European income and outlay

Incomes from	£000	Expenditure on	£000
1. Agriculture	137 <sup>2</sup>	8. Food	100
2. Commerce and trade	100 <sup>3</sup>	9. Drink and tobacco	60
3. Civil servants	205	10. Clothing, etc.	30
4. Missionaries	98	11. Rents and rates	44
5. Miscellaneous	100 <sup>4</sup>	12. Servants	23
6. Rents	39	13. Household expenditure	32
		14. Expenditure abroad	147
		15. Other expenditure	176
		16. Total current expenditure	612
		17. Investment	55
		18. Total current expenditure and investment	667
		19. Direct taxes	12
7. Total	£679	20. Total	£679

<sup>1</sup> For example, Bell gives consumption of tea and tobacco by Europeans, Asiatics and Africans (Col. No. 152, p. 269), and the section on Nyasaland in the publication, *Conditions and Cost of Living in the Colonial Empire*, Col. No. 136, gave data on normal European expenditure on servants.

<sup>2</sup> This involves an estimate of £440,000 for the net value of European agriculture.

<sup>3</sup> This involves an estimate of £375,000 for the net value of European and Asiatic trade.

<sup>4</sup> This includes some local company incomes earned in trade or agriculture.

## 2. AFRICAN EXPENDITURE.

That part of African expenditure which was spent on imports—i.e. largely on imports of food, clothing and household goods—was deduced from the import statistics as for European expenditure on imports. African expenditure on foodstuffs was less easily calculated. Again, as for Northern Rhodesia, it was necessary to start from a ration scale basis and to adjust the items according to the extent to which they could be generalised. In this case, a prisoner's ration scale was taken as the basis and used with the general information available in the *Nutritional Review* which was published in 1938.<sup>1</sup> The result was similar to that obtained for Northern Rhodesia. The consumption estimates suggested that the production estimates were too low, even when the former were reduced to as low a level as seemed reasonably appropriate. As a result of a comparison of the two sets of estimates, and after taking into account also the purchase of local foods by Europeans, the following estimates were reached.

TABLE 64. African agriculture after balancing output and expenditure

	Total output	Subsistence output
	£	£
1. Food crops	1,739,000	1,710,000
2. Meat and milk	34,000	17,000
3. Fish	50,000	27,000
4. Tobacco and cotton	200,000	5,000
	<hr/> £2,023,000	<hr/> £1,759,000

An addition of £121,000 for imputed rents brings the subsistence income up to about £1,880,000, which is an increase of nearly 15% on the original estimate. The error in this total is not less than 20%, but is unlikely to exceed 30%. Up to this point no attempt has been made to judge separately the value of native subsistence industry which has been included as part of the net return of other independent workers.<sup>2</sup> A comparison of estimates of African and European consumption of native goods and services of this kind suggests that this has been greatly under-estimated and that the total should be £110,000, of which £50,000 is subsistence output. This brings the value of subsistence output and consumption to £1,930,000, or a little over £1 per head of the total Nyasaland population.<sup>3</sup>

The cash expenditure of Africans, which was largely deduced from import statistics, was estimated to be roughly as follows:

<sup>1</sup> *Nutritional review of the natives of Nyasaland*, Zomba, 1938.

<sup>2</sup> Item 1 of table 60 and item 15 of table 61.

<sup>3</sup> It was estimated to amount to about 1,920,000 persons in 1938, compared with a Blue Book estimate of about 1,673,000.

TABLE 65. Cash expenditure of Africans

	£000
1. Food <sup>1</sup>	265
2. Clothing	429
3. Household goods	54
4. Other expenditure	78
5. Direct taxes	132
6. Total expenditure	<u>£958</u>

On the other hand, cash income of Africans has been estimated to amount to about £711,000. A comparison and a readjustment of the items, in accordance with all the previous estimates, produced the following income and outlay account for Africans.

TABLE 66. Income and outlay of Africans

Income		Outlay	
	£000		£000
1. Subsistence income	1,930	7. Subsistence output	1,930
2. Wages	363	Expenditure on:	
3. Remittances from abroad <sup>2</sup>	122	8. Food	255
4. Agricultural profits	300	9. Clothing	425
5. Other independent economic activity	115	10. Household goods	50
		11. Other expenditure	38
		12. Direct taxes	132
6. Total incomes	<u>£2,830</u>	13. Total outlay	<u>£2,830</u>

The repercussions and implications of these adjustments are worked out in full in the final tables, particularly in Table 70.<sup>3</sup>

### 3. ASIATIC EXPENDITURE.

The data on Asiatic expenditure were scanty, although some information was given on the cost of living of Asiatics in the Labour Department's report, and expenditure on imports or on home-produced foods could be calculated as a residual item after calculating European and African expenditure on these items.

An attempt to build up a total of expenditure by Asiatics, suggested that the income and output estimates, which gave a total of £222,000 for the total income of this group, over-estimated the value of their activity. Thus the following income and outlay account was drawn up for Asiatics.

TABLE 67. Asiatic income and outlay

Income		Outlay	
	£000		£000
Income from		Expenditure on	
1. Trade	200	4. Food	35
2. Government service	2	5. Clothes	13
		6. Other imports	7
		7. Other expenditure in Nyasa-land	70
		8. Expenditure abroad	31
		9. Direct taxes	4
		10. Investment	42
3. Total incomes	<u>£202</u>	11. Total expenditure	<u>£202</u>

<sup>1</sup> £15,000 estimated to have been spent on imported food.

<sup>2</sup> Net. The wages of migrants are included in full under item 2 of this table. The £5,000 they are estimated to have remitted abroad is deducted from item 3 to give the net flow of migrant labourers' remittances.

<sup>3</sup> See p. 89, below.

## 4. GOVERNMENT EXPENDITURE

An income and outlay account was drawn up for the government on the basis of the information given in the public accounts for central government activities, and in the Blue Book for local government activities.

TABLE 68. Revenue and expenditure of government

Revenue	£	Expenditure	£
1. Direct taxes, fines, gifts	342,349	6. Subsidies	6,324
2. Profits from the sale of goods and services, and revenue from property	200,525	7. Total government expenditure	819,318
3. Indirect taxes	236,301	8. Less sale of goods and services to public at cost	33,499
4. Budget deficit	12,968	9. Less purchase of capital assets	132,415
		10. Total net current expenditure on goods and services	653,404
		11. Purchase of capital assets	132,415
5. Total net revenue	<u>£792,143</u>	12. Total net expenditure	<u>£792,143</u>

## 5. COMPANY EXPENDITURE.

Finally, it was necessary to know what the companies did with their incomes, since they were not all distributed or invested locally. Bell gives an account of income tax paid by the different kinds of foreign and local companies in 1937.<sup>1</sup> By expressing this in terms of income, and by making the necessary changes for each industry, to bring it into line with conditions in 1938, an estimate was formed of income earned by foreign companies in 1938.<sup>2</sup> In addition, of course, foreign companies remit abroad other sums than those chargeable to income tax, such as head office expenses, insurance fees, directors' salaries, and so on. On the other hand, they may invest in Nyasaland, and will also leave part of their income behind in the form of tax. Taking all these factors into consideration, it was estimated that foreign companies disposed of about £369,000 through these various channels, which was in excess of what they were estimated to earn in Parts I and II of this chapter. The following balance was then drawn up for companies and took account of all incomes disbursed by them.

TABLE 69. A companies' account

Income	£000	Outlay	£000
Income from		Outlay on	
1. Agriculture	150	6. Remittances abroad	250
2. Commerce and trade	45	7. Locally disbursed incomes	25
3. Transport	119	8. Investment	25
4. Other	19	9. Direct taxes	33
5. Total incomes	<u>£333</u>	10. Total expenditure	<u>£333</u>

In this table, item 6 covers all remittances abroad, whether to meet interest charges, to be disbursed to shareholders, to be held undistributed as

<sup>1</sup> Col. No. 152, p. 263. He distinguishes tea, railway, shipping, banking, trading, tobacco, insurance companies, of all those with their headquarters outside Nyasaland.

<sup>2</sup> Total tax paid in 1938 was known.

balances abroad, or paid in tax to the United Kingdom government. Item 7 is included among European incomes in Table 63, above, and its ultimate expenditure is analysed there as part of total European expenditure.

## 6. THE BALANCE OF PAYMENTS.

Most of the items in the balance of payments have already been calculated above. Remittances from migrant labour have been adjusted upwards from the original estimate of £78,000 net (excluding tax paid direct to the government), to about £117,000 net, or a gross total of £122,000, plus £14,000 remitted as tax. The part which this estimate played in the balance of payments gave no reason to doubt that the higher figure was the more appropriate one. Remittances to missions were calculated by deducting the value of government grants and local subscriptions from the total of mission expenditure. An attempt to calculate the value of investment in imports, and of borrowing from abroad in general, suggested a figure of about £70,000. The foreign disinvestment item of the balance of payments was largely residual, however, and amounted to about £194,000. One item had to be calculated especially for the balance of payments, however, and that was the expenditure of tourists and transmigrants in Nyasaland. An appreciable number of Indian, African and European individuals passed through Nyasaland. Their number was obtained from migration figures published in the Blue Book, and their total expenditure was calculated as a function of their number. It was difficult to know how many tourists were in the colony throughout the year, and their expenditure was calculated largely on the basis of the estimated hotel accommodation. This, however, may have resulted in an under-estimate, as most visitors to the colony would not normally stay in hotels.

The expenditure side of the international account contained the foreign companies' remittances abroad and the remittances abroad of Europeans, Africans and Asiatics as individuals. The government items in the account were obtainable from the public finance accounts.

For that version of the balance of payments which is concerned only with the receipts and payments of residents, however, it is necessary to deduct from imports those goods which were bought by foreign companies, and from exports those which were produced by foreign companies. The deductions from imports were made by inspection of the import list. The deductions from exports were made by estimating which of the exports were produced by the foreign companies, and by excluding them from the merchandise exports. On the other hand, it was necessary to enter on the receipts side the remittances by foreign firms to meet the expenses of current operations in the colony, and on the payments side the payments made to foreigners for goods and services ultimately bought by nationals, such as railways, shipping, banking, insurance and other such services produced by foreign firms. The remittances abroad by companies, to meet charges (dividends, interest, etc.) incurred by foreigners in producing goods which are exported from Nyasaland, are excluded from the expenditure side of the

account. In so far as they meet charges incurred in producing goods which are sold to Nyasaland residents, they must be included as an import of services.<sup>1</sup>

Table 72 gives the taxable balance of payments. Table 74, by excluding the transactions which take place between foreign companies and foreigners, gives the balance of payments of residents.

#### PART IV. CONCLUSIONS.

Tables 72 to 74 give the final conclusions on the national income of Nyasaland. Table 70 shows the principal interconnections of the various parts of the economy in a slightly different form to that which was used to illustrate the interdependence of the various parts of the Northern Rhodesian economy.<sup>2</sup> Table 71 gives in detail the fundamental table of the enquiry—the income-output-expenditure table. Table 73 gives the same table in relation to residents only, and Tables 72 and 74 give the corresponding balance of payments tables.

The final results show changes in all the intermediate results described in this chapter. Some of the income estimates have been adjusted and re-adjusted as new data were exploited or as new implications emerged from a new arrangement of the data. Nevertheless, there are still many details which have not been directly or convincingly checked and the margin of error in this total is therefore large. An examination of the constituent results, and their estimated potential errors, suggests that the margins of error in the total may be as much as 20% and is unlikely to be less than 15%. This is a much larger margin of error than was estimated for Northern Rhodesia results. The reason is that a large proportion of the Nyasaland national income—over 46% of the residents' national income—is due to subsistence production and the error in estimates of subsistence production is considerable. On balance, there seems no reason to believe that the estimates made for income, output and expenditure in Nyasaland are more or less accurate than those made for similar types of income, or output, or expenditure, in Northern Rhodesia.

This being so, it is interesting to compare some of the results for the two colonies. On the assumption that there were about 1,920,000 Africans in Nyasaland, their income, per head, works out at about £1.475. The corresponding figure for Northern Rhodesia was about £2.46. Most of the discrepancy is due to the fact that there are many fewer opportunities for wage earning in Nyasaland and none at all of earning the kind of wage enjoyed by the worker on the Northern Rhodesian mines.<sup>3</sup> As a result, many Nyasaland natives are absentees, at work abroad, and although they remit back substantial sums to Nyasaland each year, they naturally give the country in which they are working the chief benefit of their increased purchasing power.

<sup>1</sup> See above, p. 14-19, for a general discussion of this point.

<sup>2</sup> See above, Tables 37-39.

<sup>3</sup> Part of the discrepancy may be due to the possibility that the Northern Rhodesian population has also been under-estimated in the Blue Book, but that no upward adjustment was made in producing the Northern Rhodesian estimates.

The difference between subsistence income per head in the two colonies, according to these estimates, is much smaller, but is still significantly large. The value of subsistence income in Northern Rhodesia was put at £1.2 per head of the population, and in Nyasaland at very little more than £1.0 per head. The difference can partly be attributed to the more detailed estimates that were made for the subsistence income of Northern Rhodesians. Many more crops were accounted for and evaluated. Wild foods, native beer, and other such items were calculated in some detail for Northern Rhodesia, but because data were lacking they were largely ignored for Nyasaland. It is tempting to assume that the detailed estimates were more accurate, and that the difference of £0.2 between the two estimates is accounted for by the fact that the Northern Rhodesian estimates included more items. In fact, however, it is not possible to make such precise comparisons between two such rough estimates. All that can be done is to take note of the fact that results were within 20% of one another in the two cases. Unless there was some kind of coincidence in this correspondence between conclusions reached on the basis of calculations from different agricultural systems and different price systems, it suggests a greater degree of reliability than we have hitherto been able to attribute to the estimates relating to the subsistence economy.

The cash income of Africans worked out at about £1.30 per hut in Nyasaland, assuming about 695,000 huts. This compares with results obtained by Dr. Platt for the three Kota Kota villages of about £2 per hut. If, however, we exclude income from abroad, Dr. Platt's investigations give a result of nearly £0.2 per hut compared with the result obtained here of £1.13 per hut. Since most of the opportunities for trade and wage earning occurred further south than Kota Kota and in the vicinity of the railway line, this kind of discrepancy is to be expected. It is difficult, however, to know quite what to make of the discrepancy in income received from abroad. Of the three villages surveyed by Dr. Platt, one received an average of £0.745 per hut from abroad, another received £1.07, and the other £3.1. This last was certainly not typical. But even if we generalise the result for the village receiving £0.745 we get a total of £518,000 flowing into Nyasaland from its labourers abroad. This is obviously too high. It gives an average of £7.65 per head of all Nyasaland natives away, if we exclude those not heard of since 1930. Our estimate is equivalent to an assumption that they remitted about £2 per head, including taxation, which seemed as high as it was possible to push the estimate. Nevertheless, it must be remembered that this may be an under-estimate, judging by the conditions in the three survey villages.

A comparison between the incomes of Europeans in the two colonies shows that, in Northern Rhodesia, individual Europeans at work were estimated to have earned an average of £554 each per annum. For Nyasaland the corresponding figure was £594. For both colonies the highest earner, on the average, was the civil servant and in Nyasaland there were proportionately more civil servants than there were in Northern Rhodesia. Hence it was to be expected that the average would be slightly higher in Nyasaland. On

balance, it is probable that the Nyasaland estimates are rather less reliable than the Northern Rhodesia estimates, but the difference in reliability is not great. It seems fairly probable that for both colonies the average European income is somewhere between £550 and £600.

In sum, therefore, these rough comparisons suggest that the results obtained for the two adjacent colonies are of the right order of magnitude, and that the assumptions which have been made as to the margins of error involved have not been too optimistic.

TABLE 70. Income, output and expenditure. Nyasaland, 1938

Income from	Europeans		Africans		Asiatics	Govern- ment	Total	
	Residents £,000	Foreigners £,000	Economic £,000	Subsistence £,000			Taxable £,000	Residents' £,000
1. European agriculture	160	127	153	—	—	—	440	313
2. African agriculture	—	—	325	1,759	—	—	2,084	2,084
3. Distribution	110	35	75	—	200	—	420	385
4. Transport	40	114	41	—	—	—	195	81
5. Government	205	291	54	—	2	201	753	462
6. Missions	98	—	10	—	—	—	108	108
7. Hotels, domestic services, etc.	18	—	32	—	—	—	50	50
8. Professional and financial services	10	4	19	—	—	—	33	29
9. Manufactures and building	27	—	14	—	—	—	41	41
10. Housing	39	—	—	121	—	—	160	160
11. Abroad (net)	—	—	117	50	—	161	278	308 <sup>1</sup>
12. Miscellaneous other industries	—	—	60	—	—	—	110	110
13. Total incomes available = total expenditure	£707	£571	£900	£1,930	£202	£362	£4,672	£4,131
<i>Expenditure on</i>								
14. Food, drink and tobacco	160	—	255	1,754	35	—	2,204	2,204
15. Clothing	30	—	425	—	13	—	468	468
16. Servants	23	—	—	—	—	—	23	23
17. Rent and rates	44	—	88	121	—	—	165	165
18. Other expenditure in Nyasaland	208	—	55	55	77	243 <sup>2</sup>	671	671
19. Expenditure abroad	147	541	—	—	31	—	719	178
20. Direct taxation	15	30	132	—	4	—	181	181
21. Investment	80	—	—	—	42	119 <sup>3</sup>	241	241

<sup>1</sup> Includes £30,000 received in tax from foreign companies.

<sup>2</sup> This is government net current expenditure as defined for the next table, less indirect and direct taxes.

<sup>3</sup> This is government purchase of capital assets less budget deficit.







TABLE 72. Balance of payments of the taxable nation. Nyasaland, 1938

Receipts from abroad		£000	£000	Payments abroad		£000	£000
<i>I. Sale of merchandise</i>				<i>V. Purchase of merchandise</i>			
1. Value of domestic exports				9. Value of retained imports			834
<i>II. Sales of services</i>				<i>VI. Import of services</i>			
2. Remittances from migrant labour			136	10. Remittances to foreign companies		250	
<i>III. Miscellaneous receipts from foreigners</i>				11. Government expenditure abroad		291	
3. Remittances to missions from abroad		86		12. Total value of import of services			541
4. Expenditure by tourists and transmigrants		60		<i>VII. Miscellaneous expenditure abroad by temporary residents</i>			
5. Gifts from H.M. Government		147		13. Europeans		147	
6. Total miscellaneous current receipts			293	14. Africans		5	
<i>IV. Capital transactions</i>				15. Asiatics		31	
7. Borrowing from abroad			194	16. Total expenditure abroad by temporary residents			183
8. Total receipts from abroad				<i>VIII. Capital transactions</i>			
				17. Government lending abroad			25
				18. Total expenditure abroad			
							£1,583

TABLE 73. Residents' income-output-expenditure table. Nyasaland, 1938

<i>Incomes of</i>	£,000	<i>Net output of</i>	£,000	<i>Personal consumption of</i>	£,000	£,000
1. European individuals	654	10. European agriculture	313	18. Europeans	612	
2. Companies	53	11. African agriculture	2,084	19. Asiatics	156	
3. Asiatic individuals	202	12. Distribution and transport	466	20. Africans	2,698	
4. Africans in employment at home	363	13. Manufactures and building	41	21. Total personal consumption at market prices	3,466	
5. Remittances from Africans in employment abroad—net	117	14. Government and missions	570	22. Plus subsidies	6	
6. African farmers' subsistence income	1,759	15. Income from abroad	308	23. Less indirect taxes	236	
7. Other African incomes	591	16. Other goods and services	349	24. Total personal consumption at factor cost	3,236	
8. Government incomes	392			<i>Government</i>		
				25. Net current government expenditure on goods and services	654	
				<i>Investment</i>		
				26. Net home investment	241	
9. Total net national income <sup>a</sup>	£4,131	17. Total net national output	£4,131	27. Total net national expenditure	£4,131	

TABLE 74. Balance of payments of the resident nation. Nyasaland, 1938

Receipts from abroad		£000	£000	Payments abroad	£000	£000
<i>I. Sale of merchandise</i>				<i>IV. Purchase of merchandise</i>		
1. Value of domestic exports			729	10. Value of retained imports		722
<i>II. Sale of services</i>				<i>V. Import of services</i>		
2. Remittances from migrant labour		136		11. Purchase of capital services from foreigners	64	
3. Sale of services to foreign companies		97		12. Government expenditure abroad	291	
4. Total value of export of services		—	233	13. Total value of import of services	—	355
<i>III. Miscellaneous receipts from foreigners</i>				<i>VI. Other expenditure abroad</i>		
5. Remittances to missions		86		14. Expenditure abroad by temporary residents		183
6. Expenditure by tourists and transmigrants		60				
7. Government income from abroad		177		<i>VII. Investment</i>		
8. Total miscellaneous receipts from abroad		—	323	15. Investment abroad by government		25
9. Total receipts from abroad by residents			<u>£1,285</u>	16. Total payments abroad by residents		<u>£1,285</u>

## CHAPTER V

### THE NATIONAL INCOME OF JAMAICA, 1938

The third experiment—the study of the national income of Jamaica—was at once a continuation and an extension of the previous experiments. To the original object of constructing, for a colonial territory, the system of balancing national income tables developed for the United Kingdom, was added that of extending the estimates backwards for a ten-year period. Here again, the purpose was not only to find what information on the economy could be yielded by such a treatment of the material, but also to discover the practical usefulness of the method with a view to its further application. In particular, it was hoped that this part of the experiment would show whether the system of balancing tables, and the cross-checks which it facilitates, enable useful, reliable estimates to be formed annually, on the basis of a periodical economic survey of a comprehensive nature, brought up to date by the use of a few key statistics. This is the subject of Chapter VI in this book. The present chapter is concerned with the construction of national income tables for the base year.

The formation of national income estimates for 1938 was, in many ways, less difficult for Jamaica than had been the case for either Northern Rhodesia or Nyasaland. In the first place, the economic system of Jamaica is very much nearer in structure to the United Kingdom economy for which these tables were originally developed. The subsistence production which characterises most colonial economies is a subsidiary form of economic activity. In effect, Jamaican subsistence production is theoretically analogous to the output of allotment holders in the United Kingdom, although in practice it is of a different order of significance altogether. It is an important addition to the real income of agricultural producers, but it is rarely even the main source of income.

In the second place, there were more data available on the Jamaican economy than was the case for either Northern Rhodesia or Nyasaland. It seldom took the form of the systematically collected statistics which are published in more advanced countries. There was no census of production, for example, and the last census of population before 1938 was taken in 1921. Nor were there any figures of land utilisation which would enable reliable estimates to be made of the acreage under each main crop. On the other hand, there have been a number of useful, first-hand, economic investigations since 1938, or in the ten preceding years. In 1930 a Royal Commission studied the West Indian sugar industry.<sup>1</sup> In 1935 a Commission reported on the Jamaican banana industry in considerable detail.<sup>2</sup> In 1938-39 the Labour Adviser to the Colonial Office investigated labour conditions in the West Indies.<sup>3</sup>

<sup>1</sup> *Report of the West Indian Sugar Commission*, 1930. Cmd. 3517.

<sup>2</sup> *Report of the Jamaica Banana Commission*, 1936.

<sup>3</sup> *Labour Conditions in the West Indies*, report by Major G. St. J. Orde Browne, 1939. Cmd. 6070.

Also in 1938-39 a Royal Commission went to the West Indies, and the published<sup>1</sup> and unpublished<sup>2</sup> documents arising out of its enquiries were a mine of information on economic matters. Finally, the publication of a report on the national income in 1942 by Dr. Benham, Economic Adviser to the Development and Welfare Commission in the West Indies,<sup>3</sup> illumined many dark corners of the economy, in spite of the fact that he described a changed Jamaica and adopted a different approach to the problem of national income measurement to the one attempted here.

In short, although the statistical material on Jamaica was often unreliable, rarely entirely relevant for national income purposes, and never comprehensive, it touched on more of the colony's economic activity, and gave more definite quantitative evidence, than was the case for the Central African colonies. There were no vast uncharted sectors of national economic activity to compare with African native agriculture.

In the following description of the construction of national income tables for Jamaica in 1938, the three approaches are described separately and independently. This gives a clearer picture of the variations in the results obtained by different approaches than would be possible if the cross-checking process were carried out simultaneously with the building up of the second and third columns of the income-output-expenditure table. The more adequate the material for estimate, and the greater the degree of independence with which the three columns can be constructed, the more significant are these intermediate results. If all three sets of estimates are well supported by the evidence, their variations give a useful indication of the margin of error which can be expected in the final result. Unfortunately, there was not enough evidence to give a basis for any very definite conclusions on margins of error. In particular, the third column, which is conceptually distinct from the other two, and is therefore the source of the most valuable cross checks, was weakly founded and contained a substantial residual item.

## PART I. INCOME.

For this table three main sources were used. Major Orde Browne's report on *Labour Conditions in the West Indies* provided the basic data for estimating the wage bill of the labourer. Income tax statistics gave a basis for calculating incomes at the other end of the social scale. The remaining incomes were estimated from information given in the papers presented to the West Indies Royal Commission, 1938-39, some of which have been published under the title *Agriculture in the West Indies*. In addition to these three main sources, the departmental reports and other official reports published by the Jamaican

<sup>1</sup> Especially *Agriculture in the West Indies*, 1942. Col. No. 182.

<sup>2</sup> I am greatly indebted to the Colonial Office for permission to consult these documents, and also to its officials who gave time and trouble to making the relevant papers accessible to me.

<sup>3</sup> *Development and Welfare in the West Indies*, Bulletin No. 5. *The National Income of Jamaica*, 1942, memorandum by Frederic Benham.

Government, and Lord Olivier's *Jamaica: the Blessed Island*, yielded much detail which could be used to complete or confirm estimates.<sup>1</sup>

The first stage in the process was an attempt to calculate the number of incomes attributable to each source. The following table shows the result of this attempt. It was built up by gathering together all the available information about occupations, and probably involves a considerable amount of overlap and some omissions.

TABLE 75. Occupations

Occupation or industry	Nos. estimated engaged
Labourers	218,000 <sup>3</sup>
Smallholders ( $\frac{1}{2}$ -30 acres)	153,500 <sup>3</sup>
Estate owners (over 30 acres)	4,800 <sup>3</sup>
Transport	11,600 <sup>4</sup>
Distribution	28,000 <sup>5</sup>
Professions	1,000 <sup>6</sup>
Government service	7,400 <sup>7</sup>
Clerical and administrative	17,500 <sup>8</sup>
Domestic service	40,000 <sup>7</sup>
Fishermen	900 <sup>7</sup>
Other occupations (including independent)	49,100 <sup>9</sup>
Unemployed labourers	13,000 <sup>2</sup>
Total	544,800

The weakest item in Table 75 is the residual item, 'other occupations', since it was difficult to judge either the number of occupations or the numbers engaged in the host of minor, often part-time, activities, which can seldom be dignified by the name of an industry, but which together constitute a formidable unknown. At the 1921 census the occupied population was reported as 51.7% of the total. Such a high proportion, which would give nearly 600,000 occupied in 1938, and which was equivalent to about 85% of the total population of 15 years of age and over, can only be accounted for if we assume the inclusion of a large number of unpaid dependents. This conclusion is strengthened by a difference of about 102,000 between the above estimates for those engaged in agriculture or domestic occupations, and the results which would be obtained by applying the 1921 proportions. On the other hand, Benham<sup>10</sup> estimates that there were about 475,000 wage earners in 1942. The discrepancy is probably due to a high degree of overlap in the above table. Although  $\frac{1}{2}$ -acre and smaller lots were excluded in calculating the number of smallholders, the average smallholding was barely

<sup>1</sup> All these are listed in the appendix on sources.

<sup>2</sup> Major Orde Browne's estimate.

<sup>3</sup> From the Collector-General's estimate.

<sup>4</sup> As a function of the number of commercial vehicles.

<sup>5</sup> As a function of the number of trade licences.

<sup>6</sup> From miscellaneous sources, primarily from year books. Includes those engaged in banking, finance, law, medicine, religion and private education.

<sup>7</sup> From the Blue Book.

<sup>8</sup> Guess based on tax statistics and civil service information.

<sup>9</sup> Guess based on estimates of the total occupied population.

<sup>10</sup> *The National Income of Jamaica*, 1942, p. 26.



4½ acres. It appears certain, therefore, that a considerable number of these smallholders are to be found in other occupations, particularly among the labourers.

A more recent publication, the report of the Economic Policy Committee, which gives the results of the 1943 Census on occupations,<sup>1</sup> became available too late for its results to be fully incorporated in these calculations.

The report showed a gainfully occupied population of just over 40% of the total, a proportion which would give about 430,000 for 1938. If we deduct farmers of ½-1 acre plots, and unemployed from the above estimates, to get a comparable figure, we get 440,000 persons gainfully employed, which is very little more than the result suggested by the 1943 Census. In short, if it is borne in mind that the figures in Table 75 are gross and include many persons—particularly persons occupied as smallholders, or in distribution, domestic service, labouring and other occupations—who are included more than once in this table, it seems probable that these estimates are not far from the truth.

On the other hand, it would now seem clear that the calculations of incomes which follow in the next few paragraphs were over-estimates in that they assumed higher average earnings in several of the occupations than are likely in view of what we now know about the extent of duplication and the average number of days worked per year. It has been thought best to leave the original estimates as they stand, rather than re-calculate them in the light of the later and better information. It is a favourable reflection on the general method of calculating national incomes here employed that the final figure adopted for Jamaican incomes<sup>2</sup> is closely in accord with what would now be estimated on the basis of the better data for occupations.

## 1. LABOURERS' WAGES.

Major Orde Browne gives estimates of the number of labourers engaged in the banana and sugar industries, and on stevedoring and road and construction work. He gives also daily rates of wages in the various occupations and industries. The main difficulty here lay in deciding how many days were worked per annum by each group of labourers. For the sugar industry, the Sugar Manufacturers' Association provided figures of the average number of men and women employed in season and out of season. These figures, which related to the 1935-36 crop, were given in 1938 in a statement to the House of Commons.<sup>3</sup> Judging by Major Orde Browne's total for the industry, the number of persons employed did not vary greatly between 1936 and 1938. For other industries, estimates were made, on the basis of the little information that existed, as to the regularity of work obtainable therein. For example, it was assumed that each labourer in the banana industry worked an average of 4½ days per week for 50 weeks, or a 225-day

<sup>1</sup> *Report of the Economic Policy Committee*, Kingston, 1945. P. 2.

<sup>2</sup> See Table 95.

<sup>3</sup> See *The House of Commons Report* for May 25th, 1938.

year.<sup>1</sup> Similar assumptions were made about road and construction labourers. For stevedores and other dockside labourers (wharf labour and boat men), whose wage rates are hourly rates, it was assumed that a year's work was equivalent to a 10-hour week for 40 weeks each year. Table 76 gives the estimates resulting from these assumptions.

TABLE 76. Labourers' wages

Industry or occupation	Numbers engaged	Earnings £
Bananas	100,000	2,038,000
Sugar	41,000	1,043,000
Stevedores	6,000	240,000
Other dockside labourers	19,800 <sup>2</sup>	470,000
Road and construction labourers	29,000	1,000,000
Manufacture	3,000 <sup>3</sup>	158,000
Other agricultural and miscellaneous	19,200	384,000
Total employed labourers	218,000	£5,333,000

## 2. FARMING PROFITS.

The profits derived from agriculture fell into three main categories. There were assessed profits from the working of estates, unassessed profits from the working of estates (i.e. holdings of over 30 acres) and smallholders' profits.

Five hundred and thirty-eight incomes from the working of estates were assessed, their average working out at about £880 apiece. The Collector-General reported to the West Indies Royal Commission of 1938-39 that there were about 4,830 estates or holdings of over 30 acres. Thus there were about 4,300 unassessed holdings of over 30 acres, and their profits were calculated by estimating average acreage and net profits per acre. The distribution of holdings in this group appeared to be roughly as follows:

Holdings of	No. in group	Average acreage	Total acreage
30-50 acres	1,641 <sup>4</sup>	35 <sup>5</sup>	57,400
50-about 750 acres	2,659	162 <sup>6</sup>	430,800
	4,300	113	488,200

For holdings whose average size was in the region of 113 acres the average yield of bananas among the Producers' Association's contractors was about

<sup>1</sup> Most labourers in Jamaica are employed and paid on a task basis, and rates for different tasks vary enormously. In giving his list of task rates, and also of rates for day labour, however, Major Orde Browne observes that 'In spite of the extraordinary difference in these rates, it will be found that there is comparatively little variation in the earning capacity of labourers under them, and the differences in rates are generally due to the extremely different soil and cultural conditions prevailing in the different localities.' Cmd. 6070, p. 95

<sup>2</sup> Major Orde Browne does not give the number of wharf labourers and boatmen, but he gives the cost per stem of heading, boating and stevedoring bananas and the rates of wages in each occupation. This, together with export figures, made it possible to deduce how many stevedores and other dockside labour were employed in exporting bananas, and to obtain a relationship between the number of stevedores and the number of other dock labourers.

<sup>3</sup> This estimate was derived from the Blue Book.

<sup>4</sup> From the Collector-General's returns for 1930.

<sup>5</sup> Guess.

<sup>6</sup> Average of holdings under contract to banana exporting companies in 1938 (excluding the companies' own holdings).

115 stems per gross acre. At 1.64s. per stem (which was the estimated grower's price in 1938)<sup>1</sup> this represented a return of about £9.4 per gross acre. About 73% of the gross acreage was under bananas. As far as the over 30-acre holdings were concerned, much of the remaining 27% probably lay idle or carried crops of less value. On the assumption that it yielded about one-third of the value which it would have given if under bananas, the profit per net acre on this group of banana holdings averaged about £10.33. The average cost of cultivation has been variously estimated at from £4.5 per acre to £6.58 per acre. The higher figure is probably more truly representative of the average for this group. Deducting £6.58 for cost of cultivation and £0.9 for the average rent per acre, we get a net profit per acre of £2.85, or £320 per holding of 113 acres.<sup>2</sup> This may seem high for an unassessed group, but it includes subsistence income which is untaxed. The result was therefore generalised for all holdings in the over 30-acre group, and gave a total of £1,376,000.

A similar approach was adopted in estimating the profits of holdings under 30 acres. These could be divided into four categories, as follows:

Type of farmer	Number of farmers	Size acres	Average size acres
Banana growers	39,100	179,000 <sup>3</sup>	4 58
Cane farmers	6,100	27,500 <sup>4</sup>	4.5
Other smallholders	108,300	469,200 <sup>5</sup>	4 33
$\frac{1}{4}$ -acre lots <sup>6</sup>	51,200 <sup>5</sup>	22,500	0 5

The calculation of smallholders' profits involved some difference of detail, however. First of all, the yield of bananas for the under 5-acre group was 78 stems per acre, which, at 1.64s. per stem represented a price to the grower of £6.4 per gross acre. Secondly, it seems more reasonable to assume that the average smallholder cultivates all his land and that, in view of the predominance of subsistence crops in land not under bananas, the value of the subsidiary crops should average at least as much as that of the main crop. With an average grower's price of £6.4 per gross acre of bananas, the value per net acre, if the subsidiary crops are worth as much, is in the region of £8.78. Thirdly, since the smallholder or his family will provide most of the man-power required, the money cost of cultivation will average much less than for a large holding. Hence, a point was taken between Lord Olivier's estimate of £4.5 per acre<sup>7</sup> and the estimate of £6.58 which was derived from the Banana Commission's Report and which was used in calculating estate profits. Deducting £5.54 for cost of cultivation and £0.9 for rent, we get an average net profit of £2.34 per acre for this group. Table 77 gives the results of these estimates.

<sup>1</sup> For this estimate see below, p. 107.

<sup>2</sup> The data for these estimates of net profit per acre of banana holding were largely derived from the Banana Commission's Report and *Agriculture in the West Indies*.

<sup>3</sup> From *Agriculture in the West Indies*.

<sup>4</sup> On assumption that the average size was roughly  $4\frac{1}{2}$  acres.

<sup>5</sup> Based on the Collector-General's returns for 1930 taken in conjunction with the totals reported by him in 1938.

<sup>6</sup> Quarter-acre plots or house plots were neglected altogether. It was assumed that the amount of the value obtained from them was probably cancelled by the over-estimate involved in assuming all  $\frac{1}{4}$ -acre plots to be effectively cultivated.

<sup>7</sup> *Jamaica: the Blessed Island*, by Lord Olivier, 1936.

TABLE 77. Farming profits

Type of holding	Number of holdings	Average profit per holding £	Total profit £
1. Estates (over 30 acres)			
(a) Assessed	538	880	473,400
(b) Unassessed	4,300	320	1,376,000
2. Smallholdings (under 30 acres)			
(a) Banana holdings	39,100	10.72	419,200
(b) Sugar holdings	6,110	10.53	64,300
(c) Others	108,300	10.13	1,097,100
(d) $\frac{1}{2}$ -acre lots	51,200	1.17	59,900
Total holdings	209,548	10.7	£3,489,900

## 3. PROFITS FROM TRADES AND PROFESSIONS.

For five of the items in Table 77 it was necessary to distinguish independent workers or profit-earners from employed persons or salary- and wage-earners. This involved some arbitrary assumptions and rough estimates. For the professions some—though not all—of the evidence required was obtainable from the year books. For distribution, transport, and fishing the estimates had to be made on such information as the number of trade licences, or motor trucks, or boats, information which was derived from the Blue Book or departmental reports. For the group of 'other occupations', itself a highly uncertain total, the assumption was made that two-thirds of these represented independent workers of some kind.

Table 78 gives the results of these rough estimates, and shows also the average rate of profit which has been assumed to apply in each case. Since there was no evidence of a representative nature on the average rate of profit of independent producers, these estimates were based on assumptions of the probable order of magnitude, assumptions which were derived from whatever direct or indirect data seemed to be relevant. For example, the wage of a skilled worker in the occupation, or the salary paid to members of the profession in government service, was used to suggest an order of magnitude in some cases.

TABLE 78. Profits from trades and professions

Trade or Profession	Nos. independently engaged	Assumed average profit £	Total profit £
Professions	500	352 <sup>1</sup>	176,000
Distribution	9,300	138 <sup>2</sup>	1,283,400
Transport	3,000	90 <sup>3</sup>	270,000
Fishing	300	40 <sup>4</sup>	12,000
Other	32,700	55 <sup>5</sup>	1,798,500
Total	45,800	£77	£3,539,900

<sup>1</sup> The detailed estimates were: solicitors £375 p.a., barristers £600 p.a., doctors £375 p.a., dentists £300 p.a.

<sup>2</sup> This was the average wage, with commission, of employees in a large Kingston retail store, as reported to the West Indies Royal Commission.

<sup>3</sup> This is a bus driver's wage, as reported to the Royal Commission.

<sup>4</sup> As for a stevedore.

<sup>5</sup> At 5% assessed incomes from trades and professions.

Table 80 shows what this result implies for the unassessed profit makers

#### 4. OTHER WAGES AND SALARIES.

Labourers' wages have already been calculated. The personal emoluments of those in government service can be estimated from official sources. It remains to estimate the wages and salaries of employees in the professions, distribution, transport, fishing and other occupations (for which profits have been calculated in the preceding section), and also of domestic servants and persons employed in clerical and administrative occupations. The numbers of those employed in occupations already taken into account for the calculation of profits are a remainder item after the deduction of independent workers.

The average salary or wage was not known for most cases. Here again, there was little reliable evidence, and the representativeness of wages and salaries reported to the West Indies Royal Commission had to be arbitrarily assumed. Table 79 gives the results of these assumptions.

TABLE 79. Other wages and salaries

Trade or profession	Numbers employed	Assumed average wage or salary	Total wages or salaries
Professions	500 <sup>1</sup>	210 <sup>1</sup>	105,000
Clerical and administrative	17,500	50 <sup>2</sup>	875,300
Fishing	600	23 75 <sup>3</sup>	14,300
Distribution	18,700	31 2 <sup>4</sup>	583,400
Transport	8,600	72.5 <sup>5</sup>	624,000
Domestic service	40,000	19 5 <sup>6</sup>	780,000
Other	16,400	45	738,000
Total	102,300	£36 4	£3,720,000

#### MISCELLANEOUS INCOMES.

Finally, there was a miscellaneous group of incomes which could not be calculated on an average per earner basis. The largest of these was rent. The total acreage of cultivated land was calculated from the Collector-General's returns, and evaluated at an average of 18s. per acre, which seemed a reasonable average on the basis of reports made to the West Indies Royal Commission. The number of houses was calculated on the assumption that there were between 4 and 4½ persons per dwelling,<sup>8</sup> and that the general average of 10s. per month,<sup>9</sup> given in the Blue Book, represented a fair approximation to the actual average rent per house. The number of com-

<sup>1</sup> Most of these are persons engaged in religious occupations or in private education. The average income assumed here is the average estimated to prevail for those employed by the Churches. The estimate was based on data in *The Church in the New Jamaica*, by Merle DAVIS.

<sup>2</sup> An officer worker's salary

<sup>3</sup> As for a dockside labourer

<sup>4</sup> As for a shop assistant

<sup>5</sup> The average of the wages of drivers, conductors, and mechanics

<sup>6</sup> At 7s 6d per week, including wages in kind. Major Orde Browne gives 6s. to 9s. for cash wages, and the report to the Royal Commission was 4s. to 12s.

<sup>7</sup> At the average skilled labourer's wage, i.e. 4s. per day for 4½ days per week.

<sup>8</sup> At the census of 1911 there were 4.5 persons per dwelling for the island, and at the 1921 census 4.4 persons. On both occasions the average for Kingston was 4.0.

<sup>9</sup> This is a little more than the average paid by a Kingston slum-dweller, as estimated for the purposes of a slum clearance scheme. The Blue Book average for a small cottage is £3 per month, but the rent imputable to a rural shack was much less than 10s. a month.

mercial buildings, factories, etc., for which rent must be calculated was roughly estimated on the basis of calculations already made (for the profits section) on the number of units concerned. The average rent was put at £6 per month, which is the lowest average reported for 'a large house'. This gave 1,852,000 acres of land at £1,666,800, 272,000 private dwellings at £1,632,000, and 5,000 commercial buildings at £360,000,<sup>1</sup> or a total rent of £3,658,800.

Income from abroad consisted of profits, or interest, and the remittances of emigrant labour. Assessed income from abroad was obtainable from the income tax returns, and it was arbitrarily assumed that unassessed income was of roughly the same order of magnitude. The estimate for emigrants' remittances was based partly on previous estimates, taken together with emigration statistics, and partly on the money orders paid to Jamaica from the U.S. canal zone, as reported to the West Indies Royal Commission. Interest earned within Jamaica, and casual profits, were calculated as for profits from abroad by arbitrarily assuming that the unassessed income from these sources was of the same order of magnitude as the assessed income.

Table 80 gives the results of all these assumptions, distinguishing assessed and unassessed incomes. The effect of giving the results in this form is to illustrate the great difference between the average incomes of unassessed earners and the average of assessed earners. It shows also how small a proportion of total taxable income can be directly estimated from income tax statistics.

TABLE 80. Assessed and unassessed incomes from all sources

Source	Assessed income £	Average assessed income £	Unassessed income £	Average unassessed income £	Total income £
Working of estates	472,900	880	1,376,000	320	1,848,900
Smallholdings	—	—	1,640,400	14 59	1,640,400
Trades and professions	2,566,900	1,100	972,900	22 36	3,539,800
Casual profits	5,800	84	5,800	—	11,600
Total profits	3,045,600	—	3,995,100	—	7,040,700
Official salaries and wages	318,200	459	634,800	94 75	953,000
Unofficial salaries and wages	860,800	490	2,859,200	28 45	3,720,000
Labourers' wages	—	—	5,333,000	24 46	5,333,000
Total salaries and wages	1,179,000	482	8,827,000	27 14	10,006,000
Profit and interest from abroad	102,400	364	102,400	—	204,800
Emigrants' remittances	—	—	69,000	—	69,000
Total income from abroad	102,400	—	171,400	—	273,800
Government income	—	—	—	—	202,000
Interest	369,100	372	369,100	—	738,200
Rent	95,800	—	3,563,000	—	3,658,800
Total incomes	£4,791,900	—	—	—	£21,919,500

<sup>1</sup> An allowance was made of roughly half the distributive units for workers living at home whose rent has already been included under private housing.

Table 80, however, does not give the results in the form most useful for economic analysis. Hence in Table 81 this total is broken down according to industries and type of income.

TABLE 81. Total taxable income.<sup>1</sup> The first estimate

	£	£
<b>I. <i>Labourers' wages</i></b>		
1. Bananas	2,038,000	
2. Sugar	1,043,000	
3. Docks	710,000	
4. Road and construction	1,000,000	
5. Manufacture	158,000	
6. Other agricultural and miscellaneous	384,000	
7. Total labourers' wages		5,333,000
<b>II. <i>Other wages and salaries</i></b>		
8. Professions	105,000	
9. Clerical and administrative	875,000	
10. Fishing	14,000	
11. Distribution	583,000	
12. Transport	624,000	
13. Domestic service	780,000	
14. Government service	953,000	
15. Other	738,000	
16. Total other wages and salaries		4,672,000
<b>III. <i>Profits from trades and professions</i></b>		
17. Professions	176,000	
18. Distribution	1,284,000	
19. Transport	270,000	
20. Fishing	12,000	
21. Government	202,000	
22. Other	1,799,000	
23. Total profits from trades and professions		3,743,000
<b>IV. <i>Agricultural profits</i></b>		
24. Profits from estates	1,849,000	
25. Smallholders' profits	1,640,000	
26. Total agricultural profits		3,489,000
<b>V. <i>Miscellaneous profits, interest and rents</i></b>		
27. Casual profits and interest	750,000	
28. Rents	3,659,000	
29. Total miscellaneous profits, interest and rents		4,409,000
<b>VI. <i>Income from abroad</i></b>		
30. Profits, interest, etc.	205,000	
31. Emigrants' remittances	69,000	
32. Total income from abroad		274,000
33. Total taxable income		£21,920,000

<sup>1</sup> By taxable income is meant the income generated within the territory, plus income earned by national factors of production operating abroad. The term 'national income' has been confined to income earned by national factors of production, and so excludes income of foreign factors of production operating in Jamaica. See above, p. 14-19.

An attempt to estimate the margin of error in the income table suggests a fairly high potential error, largely because most of the errors are probably in one direction. The occupation table on p. 97, which formed the starting point of the income calculations, certainly over-estimates rather than under-estimates the true state of affairs, if later evidence can be accepted as a reliable index of conditions in 1938.<sup>1</sup> In particular, it seems probable that if the numbers in each occupation have been over-estimated, then the weakest items in Table 81—particularly items 9, 15 and 22—have been over-estimated.

The section of the occupational table which gave rise to items 1-7 of Table 81 is less open to suspicion on this account, because it is directly derived from Major Orde Browne's estimates.<sup>2</sup> On the other hand, the degree of unemployment or underemployment which was described, for example, in the Economic Policy Committee's report,<sup>3</sup> was in excess of what was deduced from Major Orde Browne's evidence. Nearly one-third of the wage-earners worked an average of less than four days per week in 1942, and over one-half worked less than 40 weeks in the year. In addition, 21,688 young men and 32,468 young women were looking for work and had never had a job. On the assumption that the labourers bore the principal burden of unemployment and underemployment, and that the burden was as heavy in 1938 as in 1942, then the calculations in Table 81 over-estimate the earnings of the labourers by at least 12 %<sup>4</sup> and perhaps by more. Finally, it seems more likely that the estimates of agricultural profits are optimistic, and that the land is less intensively or profitably cultivated, than that the discrepancy is in the other direction.

On balance, therefore, although some service incomes—for example income from professions and distribution or transport—may be under-estimated, because it is difficult to trace all profits and wages from such occupations, it seems certain that the total of roughly £22,000,000, which has been reached in the first attempt to calculate the national income of Jamaica in 1938, is not an under-estimate. An examination of the potential error of each item suggests that it may over-estimate the true total by as much as 20 %.

## PART II. OUTPUT.

The output table should include the net output of each of the colony's industries, i.e. the value of total output of each industry, less the value of raw materials and of depreciation of equipment. In practice, too little was

<sup>1</sup> The later evidence which suggests these conclusions on the margin of error is contained in the Economic Policy Committee's Report, published in 1945, which gives census results for 1942-43.

<sup>2</sup> See *Labour Conditions in the West Indies*

<sup>3</sup> *Op. cit.*, pp. 13-14

<sup>4</sup> The discrepancy is likely to be smaller in the case of the sugar industry labourers, for which more adequate information was available on the rate of employment throughout the year. (See above, p. 98) It is likely to be larger for road and construction labourers, for whom employment is probably less regular than has been assumed. In fact, it seems certain that unemployment and underemployment were not as serious in 1938 as in 1942 and the degree of possible over-estimate in labourers' earnings is correspondingly smaller, although it still exists.



known about the industries to make a useful estimate of depreciation practicable. The value of raw materials and purchased services used was deducted where possible, but while the omission of any allowance for depreciation is logically indefensible, it is believed that in the circumstances of Jamaica the actual error involved is not large, and it is borne in mind in making the subsequent adjustments.

## I. AGRICULTURE.

The principal sources for the estimates of agricultural output were the departmental reports, and particularly the reports and bulletins of the Agricultural Department, *Agriculture in the West Indies*, a report compiled from documents supplied to the West Indies Royal Commission, 1938-39, some of the original documents supplied to the West Indies Royal Commission, and the *Journal of the Jamaica Agricultural Society*.<sup>1</sup> In addition, special reports on particular industries, such as the reports of the Jamaica Banana Commission, and of the West Indian Sugar Commission, were used for the industries concerned.

So far as possible, the value of output in each case was arrived at by estimating the total output produced and evaluating it, and by deducting from that total the value of materials used, as estimated from the imports of relevant materials for that year. In evaluating output the principle was adopted of estimating the value of output to the grower. This was done, either by excluding an estimated proportion for transport costs from the 'delivered Kingston' prices (obtained from the *Journal of the Jamaica Agricultural Society*) or from the c.i.f. prices at which exports were valued, or by using the actual growers' prices where these were known.

In the case of the sugar industry, for example, the total output of sugar, rum, and industrial alcohol, and the amounts exported, were recorded in the departmental reports. The value of exported sugar and of locally-consumed sugar at the factory was derived from estimates made for the West Indies Royal Commission. The factory value of rum exported, locally consumed, or stored, was estimated by deducting an allowance for transport and distribution costs from the f.o.b. value, or from a local market price given in the Agricultural Society's journal.

The bulk of the banana crop, and the whole of the proportion exported, was handled by the exporting companies, or the Jamaica Banana Producers' Association. No figure for total deliveries to these companies was available, but rejections were reported in the Legislative Council Minutes, both as absolute figures and as a percentage of total deliveries. Bananas consumed by the grower, or sold by him locally, have still to be reckoned. It is unlikely that these constituted a high proportion of total output, and their quality, as expressed in terms of the number of stems equivalent to a count bunch,<sup>2</sup> is probably low. It was assumed that about 2,000,000 stems were produced

<sup>1</sup> i.e. the J.J.A.S., as it is called elsewhere in this chapter.

<sup>2</sup> A payable or count bunch is a 9-hand stem. A stem with 6 hands is equivalent to a quarter of a count, and is saleable only in times of shortage.

by growers for their own consumption or local sale.<sup>1</sup> In all, therefore, it was estimated that about 33,637,000<sup>2</sup> stems were produced in 1938.

Bananas handled by the companies were evaluated at their f.o.b. price, less an estimate for average costs of handling and transport. Expenses incurred in carrying fruit to the railway or other selling point were put at 2d. per bunch,<sup>3</sup> and the cost to the companies of transporting and handling it as far as the steamer were estimated to average 1s. 1d.<sup>4</sup> Thus, given an estimated count bunch ratio for company-handled produce of 65% and an f.o.b. price of 2.45s. per stem, the grower's price was calculated to be in the region of 1.64s. per stem. Rejects were reported to fetch an average of 4d. per stem at the wharves,<sup>5</sup> and locally consumed or sold produce was evaluated at cost of production, plus a percentage for profits, which was roughly one-third of the percentage on company-handled produce.

These assumptions and calculations gave rise to the following estimates:

TABLE 82. Value of output of bananas

Stems produced	Market	Grower's price per stem	Total growers' return £
23,811,000	Company exports	1.64s.	1,952,500
5,497,000	Company home sales	1.64s.	450,800
2,329,000	Company rejects	0.33s.	38,800
2,000,000	Growers' home sales or consumption	0.64s.	64,000
<u>33,637,000</u>	All markets	<u>1.48s.</u>	<u>£2,506,100</u>

The production of citrus fruits, coconuts, coffee, cocoa and tobacco, and the growers' value for each of these, was largely estimated on the basis of acreage, yield, and price, or cost, statistics obtained from *Agriculture in the West Indies*, or from the relevant documents presented to the Royal Commission. Some information was obtained from other sources, such as the Agricultural Society's journal. Occasionally estimates of total production, based on acreage and yield statistics, were checked by estimating home consumption and adding exports. This was done, for example, for coffee, which is widely grown as a peasant crop, and for which the estimates of acreage made for the Royal Commission are likely to be underestimates. Similarly, a special variety of tobacco is grown by peasants for purely local consumption, and the acreage under this is unlikely to be included in the official estimate of land under tobacco. The value of the output of pimento, ginger, logwood and bitterwood was estimated on the assumption that all but a negligible quantity of output was exported. In all these cases, unless a growers' price was recorded in the Agricultural Society's journal, or in the

<sup>1</sup> This is equivalent to about 10 stems per acre under bananas.

<sup>2</sup> This represents an average yield per acre of about 168 stems and a count bunch ratio of about 61.2%.

<sup>3</sup> Lord Olivier puts the average cost at 3d. per bunch. This was reduced by one-third to allow for growers providing their own transport who would incur only a fraction of the cost.

<sup>4</sup> It was reported in the J.J.A.S. in 1935 that it cost the Jamaica Producers' Association an average of 1s. 1d. per bunch to take the fruit from grower to steamer.

<sup>5</sup> See the J.J.A.S., 1935.

documents presented to the Royal Commission or in some official report, it was estimated by making what seemed to be a suitable deduction from the local market price or the c.i.f. price.

The value of raw materials used in these industries was estimated, largely on the basis of import statistics, to be £51,000 for the banana industry, £70,000 for the sugar industry, and £18,000 for other agricultural industries.

The results of these estimates are given below in Table 83. The last item in that table is a very rough estimate of the value of ground provisions, and other miscellaneous crops, produced primarily for home—often for subsistence—consumption. It has been assumed that these fairly intensively cultivated crops are of a value of about £10 per acre.

TABLE 83. Total value to producer of agricultural products

	Area (acres)	Output	Value of output £
Sugar	38,000	{ 118,188 tons sugar 1,523,300 galls. rum 57,900 galls. alcohol }	1,530,000 <sup>1</sup>
Banana	202,100	33,637,000 stems	2,506,000
Citrus fruit	5,800	1,150,000 boxes	204,000
Coconuts	49,000	110,000,000 nuts	154,000
Coffee	20,000	11,200,000 lb.	162,000
Cocoa	20,000	5,300,000 lb.	40,000
Pimento	4,000	8,676,800 lb.	191,000
Logwood	100	20,000 tons (approx.)	12,000
Ginger	100	2,930,600 lb.	34,000
Tobacco	2,700	{ 250,000 leaf tobacco 1,180,000 Jackass rope }	170,000
Bitterwood	—	900 tons	1,000
Sisal	1,000	250 tons	4,000
Honey	—	150,000 galls.	12,000
Ground provisions and miscellaneous	184,000	—	1,840,000
Total value of output to grower			6,860,000
Less materials used in production:			
Bananas			51,000
Sugar			70,000
Other exported crops			18,000
Total value of materials used			139,000
Total net value of output			£6,721,000

## 2. LIVESTOCK.

The amount of meat produced in the colony during the year was calculated by estimating the number of each kind of livestock slaughtered, and its average dressed weight. The number of cattle slaughtered during the year, for example, was recorded in the departmental reports. The number of sheep slaughtered was found by assuming that they bore the same proportion to cattle slaughtered as did the sheep recorded in the incomplete returns from slaughter-houses in 1938-39, which were given in the *Report on the Utilisa-*

<sup>1</sup> This is factory value and includes factory output.

*tion of Animal By-Products.* For goats a number was found by assuming that it equalled the number of goatskins exported during the year. For swine the number was deduced from an article by the colony's Livestock Officer, Mr. Howe, in the Jamaica Agricultural Society's journal of October 1939. This article also gave average dressed weights for cattle and swine. For goats and sheep a rough guess of average weight had to be made on the basis of the average in other areas.

A committee of the Jamaica Agricultural Society gave, in an appendix to the Dairy Committee's *Report*, figures which made it possible to arrive at estimates of the cost of production of beef (including farmers' profit), or farm value. For other types of meat it was assumed that farm value bore the same proportion to retail value as was the case for beef. Retail values are published in the Blue Book or in the Annual Report for the colony.

The results of these estimates are included in Table 84, below, which includes also estimates of the value of milk and butter produced (as given in the departmental reports) and of the value of the output of hides and skins (on the assumption that all but a negligible quantity were exported).

TABLE 84. Output of livestock products

	No. of animals slaughtered	Total dressed weight lb.	Value to farmer £
Beef	35,726	14,290,400	268,000
Pork	50,000	5,000,000	117,200
Mutton	3,500	175,000	6,600
Goatflesh	172,900	8,645,000	243,200
Total meat		28,110,400	635,000
Milk			36,500
Butter			1,100
Hides and skins			14,300
Total meat and by-products			686,900
Less imports of animal feeding-stuffs			13,300
Total net farm value of livestock products			£673,600

### 3. FISHING.

In the 1937 Blue Book it was estimated that there were about 2,105,600 lb. of fish caught in Jamaica. This compares with the 2,808,000 lb. estimate entered in the Blue Book for the preceding ten years or so. It is assumed that the catch in 1938 was in the region of 2,100,000 lb. The retail value of fresh fish in 1938 was 9d. per lb. If we assume that the fisherman received about 6d. per lb., the gross value of the fishing industry's output was about £52,500, and the net value (less, say, 10% for materials) was about £47,200.

### 4. MANUFACTURE.

The Blue Book gives incomplete returns for numbers employed, raw materials used, and gross output of local factories. Some additional informa-

tion was obtainable from the documents presented to the West India Royal Commission. Most local factories produce entirely or primarily for local consumption, but for some products the export figures were a guide to production. Dr. Benham's close estimates for 1942 were also useful, although there had been considerable progress in the manufacturing industry since 1938.

TABLE 85. Value of net output of manufactures

	Nos. estimated employed <sup>1</sup>	Net value of output <sup>2</sup> £
Cigars, cigarettes, matches	400	112,400 <sup>3</sup>
Ale, beer, aerated waters, etc.	500	97,000
Shirts	160	52,000
Copra, oil, soap, meal	660	37,900
Biscuits	120	27,700
Pimento and logwood extracts	260	14,300
Ice and electricity	120	13,900
Sisal, rope, cordage	390	6,200
Leather and tanneries	60	6,200
Miscellaneous	180	4,400
	<u>2,850</u>	<u>£372,000</u>

It is important to notice that Table 85 excludes sugar factories altogether; it seemed more convenient to include their output as part of agricultural output. In this table the object has been to include only the value added by the process of manufacture. The value of the coconuts used in the oil and copra factories, for example, has been treated as part of the value of raw materials, and has been excluded in arriving at a figure for net output.

## 5. BUILDING.

There were no data which would give a direct and reliable basis for estimating the volume of new building which took place during the year. All that could be done to gauge the probable order of magnitude of the value of residential building was to assume some relation between the average rate of population increase and the rate of building. Such assumptions, combined with estimates of average value derived from data supplied to the Royal Commission, gave about 7,000 houses built during the year at a gross value of about £560,000 and a net value (excluding raw materials and replacements) of about £310,000. To this was added an estimate for the value of

<sup>1</sup> These estimates were derived from the Blue Book returns. They are rough, but the total is probably accurate within about 10%.

<sup>2</sup> Unless otherwise stated these are derived from the Blue Book returns. Usually it was necessary to generalise output per head on the basis of the figures for those factories in each group which give full returns. On the assumption that they will tend to be the larger and more efficient factories this will tend to be an over-estimate.

<sup>3</sup> Annual output of tobacco products was derived from the Blue Book, and their value was estimated by using Benham's figures for retail value in 1942 with the necessary deductions suggested by him. This involves assuming a similar scale of prices and deductions for 1938 as for 1942. The estimate for the net value of the output of matches (£2,600) was a guess. It represents about 50% of the 1942 net output deduced from Benham's figures.

new factories and other commercial establishments. This was put at about £340,000, after deducting for raw materials and purchased services.

The total value of the output of the building industry was thus put at about £650,000. But this is no more than a very rough guess. The only direct quantitative evidence with which it could be checked was Dr. Benham's estimate for the gross value of building and construction in 1942.<sup>1</sup> The 1942 figures are not directly comparable with the estimate given above for 1938, but an attempt to reduce them to some kind of comparable basis suggests that the 1938 estimates are over-estimates. The usefulness of this conclusion is reduced by the fact that, at least as far as residential building was concerned, the estimates represent more what might be expected to have been constructed, given existing standards of population density per house, and the rate of increase in population, than what was in fact constructed, and the value attributed to the new housing did not relate in any way to the rough shacks which might have been built in some rural area. On the other hand, the discrepancy in the two sets of estimates might be due to the war conditions which Dr. Benham's estimates reflect.

## 6. DISTRIBUTION.

It was very difficult to make any estimate of the value of the net output of this industry, largely because the number of units concerned was not known. It is possible to obtain an idea of the number of larger shops and stores from the commercial directories. But there must be a large number of small independent traders whose name would appear in no directory. The estimate was therefore arrived at by approaching it from two points of view and averaging the results. First, the net value of distribution was calculated by estimating its proportionate addition to grower's value, or its share in final value. Secondly, the number of persons engaged in the industry was estimated on the basis of the 1921 census and combined with an estimate of the value of net output per person engaged.

The two estimates were necessarily crude. On the one hand, the proportionate value of distribution had usually to be guessed, although for exported bananas some basis of estimate was found in the costs of the Jamaica Producers' Association, and for meat the proportion for beef given in the Dairy Committee's *Report* could reasonably be generalised. Elsewhere, arbitrary proportions had to be adopted on what was known of the commodities concerned, and on the assumption that the cost of distributing imports in general amounted to 25% of their c.i.f. value. On the other hand, the estimate of 27,700 for numbers employed in distribution was found by adding to the 1921 census report of those engaged in commercial occupations, a proportion equal to the increase in total population over the period 1921-38. This was obviously a very inaccurate procedure. The estimate of £150 per annum for net output per person employed was also a guess, being based simply on a high average wage for a male shop assistant.<sup>2</sup>

<sup>1</sup> See *The National Income of Jamaica*, 1942, pp. 22-23.

<sup>2</sup> It was stated in evidence before the Royal Commission that the average wage for a male shop assistant varied from 20s. to 60s.

The two results were £4,774,800 and £4,155,000, respectively, for the net value of distribution. If it can be assumed that the actual value of distribution falls between the two points, the average of £4,469,800 has a margin of error of 7%. Although it seems probable that this was the case, it is by no means certain and the true margin of error may be over 10%.

## 7. TRANSPORT.

The principal sources for the estimate of the output of transport were the railway statistics, together with the information available in documents presented to the Royal Commission. This included material on the costs and receipts of some of the more important Jamaican passenger transport companies.

The problem of evaluating road transport was also approached from two main aspects. One estimate was made on the basis of traffic carried and average receipts therefrom, adjusting the resulting estimates of gross output for raw materials used. A second estimate was made on the basis of the number of units operating (buses or trucks), and the estimated income of each unit.

It was assumed that the number of passengers carried by road and rail in 1938 was roughly equivalent to the number carried by rail in 1921, plus an additional 35%, to allow for the increase in population over the period. Road passenger traffic was evaluated on the basis of the railway figure for average receipts, and net output was calculated as 50% of passenger receipts, this percentage being derived from the scanty material on road passenger costs which existed amongst the evidence supplied to the Royal Commission. Short distance or town passenger transport was calculated on the basis of statistics of passengers carried, and the average fare, or of the total receipts, according to which type of information was available for the various companies concerned. The second estimate was made on the basis of the number of buses operating in Kingston and the country districts, and on the average wages of the drivers and conductors which these would have to support, together with an estimated allowance for profits. These again were based on material given in documents presented to the Royal Commission. The two estimates—which gave £86,000 and £113,000 respectively for gross receipts—were averaged to give a result of about £100,000 for road and rail passenger transport. Net output for rail transport was assumed to be equivalent to personal emoluments,<sup>1</sup> and for road transport to 50% of gross receipts. The resulting estimate for the net output of road and rail passenger transport was in the region of £54,200.

It was reported that 60% of the total output of bananas was carried by rail. Statistics were available for total tonnage of each class of goods carried by rail. On this, and on the assumption that the railways carried only 30% of the other goods carried on the island, a total of 400,000 tons was reached for all goods carried by road. Since road traffic probably included a higher proportion of dearer traffic, it was assumed that the average receipts should

<sup>1</sup> The railway is a government concern.

be at least 10% higher than the average for rail traffic. The second estimate was made on the assumption that each truck involved wages to the value of £2 per week, and each trailer 10s. per week, plus an addition for other output items (e.g. interest, or rent, or salaries) of 25%. This again was averaged with the estimate derived from goods carried, and gave a total net output for road and rail goods of £404,000. The net output of boating and haulage, etc., on the docks was assumed (by analogy with the proportions for transport cited in the Jamaica Agricultural Society's *Journal*) to amount to about four-fifths of the net output of road and rail (goods) transport, giving a total of all forms of transport of about £781,000. This is a very crude estimate.

#### 8. GOVERNMENT SERVICE.

For the purposes of the output column, the net output of governmental services was defined as the income received by persons in the government's employ, together with income from government property and profits from trading services provided by the government. This included the personal emoluments of civil servants and of persons employed by the local authorities, and the profits or income from property of both central and local government authorities. The output of the government railway was, however, included as part of the output of the transport industry.

#### 9. DOMESTIC SERVICE, HOTELS, CLUBS, ENTERTAINMENTS, ETC.

The income of domestic servants has already been estimated for the purposes of the income column. It remains to estimate the profits of hotels and clubs, and also of entertainments, such as cinemas or racecourses. Expenditure on these items was calculated on the basis of information as to their number, accommodation, and price or rates which could be collected from such publications as the *West Indies Year Book*, the *Jamaica Handbook*, *Public Life and Sport*, and other guides, or year books, or directories. Net output was then estimated as a proportion of total expenditure, the proportion being based on actual operating statistics where these were available. The resulting estimates were as follows:

TABLE 86. Domestic service, hotels, entertainments

	Net value of output
	£
Domestic servants	780,000
Hotels and guest houses	194,000
Restaurants and clubs	38,000
Entertainments (cinemas, racing)	40,000
	<hr/> £1,052,000 <hr/>

#### 10. PROFESSIONAL SERVICES.

Dr. Benham's estimates for 1942 formed the basis of the estimates relating to education, religion and medical, dental, legal, financial and other professional services. He gives the value of public expenditure on secondary



education in 1939 as £40,000 to £45,000, after deducting the cost of food included in boarding fees. Deducting a further 20% for other materials and services purchased from outside the industry, and assuming that the value of expenditure in 1938 was £40,000, we get a net value for secondary education of £32,000. Financial services are unlikely to have increased very much in value since 1938, and Dr. Benham's estimate for 1942, less 20% for cost of materials, etc., was again accepted. Dr. Benham bases his estimate of the numbers engaged in the medical, dental, and legal professions on material in the 1939 year book, which relates for the most part to the year 1938. It seemed probable that his estimate for the expenditure of the public on these and other services is valid for 1938 also. Most of this expenditure will defray the cost of profits, rents, wages and salaries, but a small proportion—estimated at 10%—should be deducted for purchased materials and services. The following results were obtained.

TABLE 87. Professional services

	Net value of output
	£
Secondary education	32,000
Financial services	160,000
Medical services	135,000
Dental services	67,500
Legal services	202,500
Other	45,000
Total professional services	<u>£642,000</u>

## 11. NEWSPAPERS, PRINTING, ETC.

The output of the newspaper, book and printing industries was estimated from circulation figures and prices given in the Blue Book, and from the cost proportions of the Government Printing Office. The value of raw materials used in the industry was deduced from import statistics. On this information, and on a number of fairly arbitrary assumptions, such as the assumption that advertisers contributed about as much as purchasers to the total receipts of the newspaper industry, it was estimated that the net output of the newspaper and printing industry was in the region of £91,000, excluding the output of the Government Printing Office.

## 12. BAKING.

It was assumed that the bakeries absorbed 80% of the imports of flour<sup>1</sup> which gave a basis for estimate of the total retail value of the bread produced. After deducting the value of the flour and also of other materials and services consumed in baking the net value of output appeared to be in the region of £418,300.<sup>2</sup>

<sup>1</sup> The remainder was assumed to have been consumed directly or absorbed by the biscuit factory.

<sup>2</sup> Other ingredients appeared on the basis of Dr. Benham's estimates to amount to about 11% of the retail value of the bread. Other materials and services, such as fuel, containers, etc., were more roughly deduced from Dr. Benham's figures.

## 13. MISCELLANEOUS INDUSTRIES AND SERVICES.

A group of miscellaneous industries and services about which very little is known is given in Table 88, below. Estimates for charcoal and firewood, and for shoe repairing, were derived from the report of the Committee on the Cost of Living of Sugar Workers during Crop, 1941. The value of output of charcoal and firewood for domestic use, and of shoe repairing, was estimated on the basis of the average expenditures per head given in the same report.<sup>1</sup> Furniture making was evaluated on the assumption that the retail value of home-produced furniture was three-quarters that of imported furniture in 1938, and that the producer's price was equal to retail price less 30%. About one-third of the value to the producer was estimated to be due to the cost of materials and purchased services.<sup>2</sup> For the other items in this table Dr. Benham's estimates were the only data available, and it was roughly assumed that the deductions due to be made to give 1938 net value were equivalent to about 50% of the 1942 retail value.

TABLE 88. Value of miscellaneous industries and services

Industry or service	Net value of output £
Charcoal and firewood for domestic consumption	87,800 <sup>3</sup>
Lumbering	30,000
Cottage industries	20,000
Furniture making	17,000
Shoe repairing	245,700 <sup>4</sup>
Tailoring and dressmaking	250,000
Laundry and drycleaning	20,000
Hairdressing and beauty parlours	25,000
Other personal services	50,000
<b>Total miscellaneous</b>	<b>£745,500</b>

## 14. HOUSING, INCOME FROM ABROAD, AND OTHER ITEMS.

The value of private housing, i.e. the total rent imputable or paid, has been estimated already for the income column. Income from abroad has also been entered in the first column. No entry has been made for other industries and services which may have been omitted from this column. If their output is of appreciable magnitude it should be evident when the three columns are compared.

<sup>1</sup> Dr. Benham quotes the committee's results and makes his adjustments for 1942

<sup>2</sup> This was the proportion which Dr. Benham ascribed to materials in making his estimate. For all these items Dr. Benham's estimates were drawn upon freely for indications of the proportions which retail margins, cost of materials, and other necessary deductions, would bear to total value

<sup>3</sup> In effect the assumption made here was that expenditure on charcoal and firewood amounted to 1d per head, and that retail and distributive charges amounted to 30%

<sup>4</sup> Here the assumption was that the expenditure on shoe repairs amounted to 6d per household per week, and that materials counted for 30%

TABLE 89. Total taxable output. The first estimate

	£	£
I. <i>Agriculture, livestock, fishing</i>		
1. Banana industry	2,455,000	
2. Sugar industry	1,400,000	
3. Other export crops	966,000	
4. Livestock	674,000	
5. Ground provisions and miscellaneous	1,840,000	
6. Fish	47,000	
7. Total net output agriculture, livestock, fishing		7,442,000
II. <i>Manufactures and construction</i>		
8. Manufacture	372,000	
9. Residential housing	310,000	
10. Non-residential construction	340,000	
11. Total net output manufactures, building and construction		1,022,000
III. <i>Distribution and transport</i>		
12. Distribution	4,470,000	
13. Transport	781,000	
14. Total distribution and transport		5,251,000
IV. <i>Miscellaneous industries and services</i>		
15. Baking	418,000	
16. Newspapers and printing	91,000	
17. Lumber, firewood, furniture	135,000	
18. Cottage industries	20,000	
19. Professional services	642,000	
20. Government service	1,152,000	
21. Domestic, hotels and entertainment	1,052,000	
22. Tailoring, dressmaking, cobbling, laundry	516,000	
23. Hairdressing and other personal services	75,000	
24. Housing	1,632,000	
25. Total miscellaneous industries and services		5,733,000
V. <i>Income from abroad</i>		
26. Profits	205,000	
27. Emigrants' remittances	69,000	
28. Total income from abroad		274,000
29. Total net taxable output		£19,722,000

An attempt to attribute some kind of margin of error to the first output calculation, by summing the margins of error of the various parts, suggests that the error in the total is between 10 % and 15 %, which is more optimistic than was the conclusion for the income column. The reason is not that the various constituents are more reliable, but that their errors more often tend to cancel each other. On the other hand, a method which seeks to measure national income primarily by finding evidence of the finished product, is likely to suffer from the omission of goods and services for which the necessary evidence was not available. This is particularly true in the case of goods or services produced locally for local consumption. These tend to escape the statistical reporting system altogether in a country where there is no census

of production. On the other hand, the attempt to deduct the value of raw materials and purchased services from the value of the final product is itself often characterised by errors of omission, which means that a certain amount of double counting and of overlap between the various output estimates must be suspected.

On balance, it seemed a little more likely that the estimate of £19.7 million was an under-estimate than that it was an over-estimate, although the evidence was not sufficient to be convincing. A rough attempt was made to compare Dr. Benham's estimate for 1942, which was derived by the output method, with this estimate for 1938. This involved certain assumptions as to the price change, assumptions which were by no means firm. Data on the change in import and export prices, which increased by 76% and 78% respectively, in the period 1938-42, were given in the Economic Policy Committee's report.<sup>1</sup> So far as could be deduced from a comparison between Dr. Benham's estimates and the retail price statistics available for certain major home-produced commodities in 1938, there was very little change indeed in the prices of these commodities. It seemed likely that the total price change was in the region of 54%, and that, on the assumption that Dr. Benham's estimates were accurate, and that there was no change in net output per head, the net national taxable income per head of the population was in the region of £16.9 in 1938, which gives a total of about £19.6 million.

### PART III. EXPENDITURE.

The third column of the income-output-expenditure table shows the net national income in the form of expenditure. It includes personal consumption measured at market prices, net government expenditure on goods and services, less indirect taxes (which are included once already in market prices), and investments. Since this is taxable expenditure, it must include not only the incomes due to national factors of production, but also the income emanating from sources within the territory, which goes to, and is disbursed by, foreign factors of production such as foreign shareholders. The payments abroad, in return for the loan of foreign capital, are included in one item called remittances abroad.

#### 1. PERSONAL CONSUMPTION.

In August 1939 a cost of living survey was conducted in Kingston which showed an average weekly expenditure of about 17s. 6d. per household per week, or an average annual expenditure of about £45. Before using this budget as a pattern of expenditure for the island as a whole, an attempt was made to assess its representativeness. Expenditure on clothing was estimated from imports by adding duties and percentage additions for distributive charges.<sup>2</sup> Expenditure on rates and taxes was estimated from the public accounts, by making a deduction for the percentage estimated to have been

<sup>1</sup> Op. cit., p. 9.

<sup>2</sup> These percentage additions were based on margins applicable in the United Kingdom unless specific data were available for Jamaica.

paid by institutions. A comparison of these two results with those reached by straight generalisations from the cost of living survey suggested, in both cases, the conclusion that the average of the cost of living survey required an addition of roughly 25 % to give a representative average.

With this qualification, therefore, the results were generalised, and then scrutinised on the basis of evidence which might help to throw light on the individual items. In the estimates which are given in Table 90, items 3 and 7 are simply generalisations from the cost of living survey with a 25 % addition. Items 5 and 6 had already been separately estimated, in testing the representativeness of the survey, and are roughly 25 % more than a straight generalisation from the cost of living survey would give. Items 1 and 2 are each the average of three estimates. They are based on the cost of living survey average, the cost of living survey average scaled up by 25 %, and a separate estimate based, in the one case, on another budget survey's average and, in the other case, on the aggregate of such data as imports of fuel and cleaning materials, and estimates of expenditure on home-produced fuel and cleaning materials.<sup>1</sup> Item 4 involved the assumption that the proportion of total consumption or expenditure absorbed by rent charges would not rise to anything like the same extent as that part of expenditure devoted to clothing or direct taxation. The cost of living survey average was adjusted upwards by only half the 25 % proportion in making this estimate. The results of these generalisations and adjustments are given in the table below.

TABLE 90. Personal consumption

	£
1. Food	9,380,400
2. Fuel and cleaning	981,500
3. Doctors and medicines	630,000
4. Rent	2,521,200
5. Rates and taxes	182,500
6. Clothing	1,813,800
7. All other	3,301,300
8. Total	<u>£18,810,700</u>

## 2. INVESTMENT.

There was no direct evidence available on net investment or saving in Jamaica, and it was necessary to fill this gap in the expenditure table by a series of guesses. An attempt to reach a rough order of magnitude by estimating what proportion would be saved out of each of the items in Table 81 gave a total of about £1,005,000, excluding government savings. An addition of £205,000 for government savings<sup>2</sup> brought the total to £1,210,000. This was regarded as too high—first, because the estimates in Table 81 are probably overestimated, and secondly, because they include incomes earned by foreigners.<sup>3</sup> A downward adjustment to allow for both these factors

<sup>1</sup> For example, an estimate of expenditure on charcoal and firewood was made for the output column.

<sup>2</sup> See below, Table 91, p. 120.

<sup>3</sup> Net consumption and investment of foreign shareholders are included together as 'remittances abroad' in the estimate for taxable expenditure. They are excluded altogether from the estimate for residents' income.

gave a total estimated net investment, including government savings, of about £1,028,000.

The problem was approached also from the opposite angle of total net investments, calculated according to the channels of investment. This involved summing the values of all the various forms of investment—expenditure on new machinery, buildings, public works extraordinary, and increases in stocks or balances or security holdings. Again the evidence was very scanty and probably failed to cover all forms of investment. Moreover, allowances had to be made to exclude replacements and renewals and to include only net new investment. The total direct investment in Jamaica estimated by this means appeared to be in the region of £1,998,000. This however, includes investment financed by borrowing abroad—or by foreign disinvestment, as it is called. To get net investment it is necessary to cancel that part of home investment which is financed by foreign disinvestment. A combination of these two estimates—£1,028,000 for net total investment by Jamaicans, and £1,998,000 for net total investments in Jamaica, suggests a net import of capital of about £970,000. This group of estimates could later be checked in the light of the evidence provided by the balance of payments.

### 3. GOVERNMENT ACTIVITY.

The activities of the public authorities must be recorded in the expenditure column, in the form either of net current expenditure on goods and services, or of investment,<sup>1</sup> or of adjustments to the expenditure of the private and commercial sectors of the economy. Since expenditure by private individuals and by commercial companies is calculated for this table at market prices, it includes indirect taxes and excludes subsidies. To give the value of expenditure at factor cost, it is necessary to adjust by the addition of an amount equal to the value of subsidies, and the deduction of an amount equal to the value of indirect taxes.<sup>2</sup> In theory, the deductions and the additions should be spread over all items in this column, in so far as they represent expenditure on goods and services which have been taxed or subsidised. In practice, it is convenient to deduct them from the personal expenditure item, since all but a negligible fraction of taxes or subsidies on goods and services appear under this heading.

Table 91 gives a combined revenue and expenditure account for both local and central authorities, which sets out, in convenient form, the principal data required for national income tables. It will be seen that the budget surplus is defined to include all government investments financed out of current revenue, whether it be in the form of increased cash holdings, or actual public works expenditure.<sup>3</sup> Item 6 includes the incomes estimated to have been paid to persons abroad in the form of interest, pensions, etc.

<sup>1</sup> Included above in the section on investment.

<sup>2</sup> In effect the services bought by indirect taxes are excluded from the personal expenditure item and shown in this column as part of the net expenditure of the government.

<sup>3</sup> Included above in the section on investment.

TABLE 91. A combined revenue and expenditure account for the local and central authorities

REVENUE		EXPENDITURE	
	£000		£000
1. Direct taxes, fines, gifts	372	5. Subsidies, grants, etc.	306
2. Indirect taxes	2,281	6. Expenditure on services abroad	73
3. Government income from property and profits from trading services	202	7. Total expenditure on goods and services in Jamaica	2,715
		8. Less value at cost of goods and services sold to the public	335
		9. Less government purchase of capital assets	109
		10. Net current expenditure on goods and services	2,271
		11. Budget surplus	205
4. Total net revenue	<u>£2,855</u>	12. Total net expenditure	<u>£2,855</u>

## 4. REMITTANCES ABROAD.

Remittances abroad on commercial account were calculated from an examination of the available accounts of foreign firms. Since these accounts were not available in all cases, and since it was not possible in any case to define with any degree of precision the proportion of total dividends which flow abroad, this item was not firm. A similar problem arose when attempting to distinguish what part of the government's debt service payments were paid within the country, and what constituted incomes flowing to foreigners.

TABLE. 92 Total taxable expenditure. The first estimate

I. <i>Personal consumption</i>	£	£
1. Food	9,380,000	
2. Clothing	1,814,000	
3. Rent	2,521,000	
4. Fuel and cleaning	982,000	
5. Doctors and medicine	630,000	
6. All other	3,301,000	
7. Total personal consumption at market prices	18,628,000	
8. Less indirect taxes	2,281,000	
9. Plus subsidies	306,000	
10. Total personal consumption at factor cost		16,653,000
II. <i>Government expenditure</i>		
11. Net current government expenditure on goods and services		2,271,000
III. <i>Investment</i>		
12. Total home investment	1,998,000	
13. Less net foreign disinvestment	970,000	
14. Total net investment		1,028,000
IV. <i>Remittances abroad</i>		
15. By commercial companies	622,000	
16. By government	73,000	
17. Total remittances abroad to foreign property holders		695,000
18. Total taxable expenditure		<u>£20,647,000</u>

The expenditure table was the weakest of all the three estimates of national income. As an independent calculation it had a very high margin of error amounting to nearly 25 %. Although there was a slight presumption in favour of its being an over-estimate it was by no means certain, at this stage, in which direction the potential discrepancy was most likely to show itself. The estimates on the expenditure side of the balance sheet will be strengthened by checking them with the balance of payments, which is calculated in Part IV of this chapter. Nevertheless this section of the income-output-expenditure table is only a very rough check on the other two sections. It is too weakly founded, even when combined with the balance of payments, to bring greater precision to the income and output estimates.

#### PART IV. THE BALANCE OF PAYMENTS.

The value of domestic exports, and of retained imports, was calculated from the official import and export statistics, and profits from abroad from the income tax returns.<sup>1</sup> Investment by foreign firms operating in Jamaica was treated as Jamaican borrowing (or Jamaican disinvestment).<sup>2</sup> It was estimated on the basis of data relating to the capital expenditure of the principal foreign firms operating in Jamaica.<sup>3</sup> It was estimated that foreign firms invested about £838,200 in Jamaica in 1938, and the net loan raised in England and spent by the government was given as £517,400 in the public accounts. This gives a total Jamaican disinvestment of about £1,356,000.

Receipts from foreign religious organisations were deduced from Merle Davis' *The Church in the New Jamaica*, and from the *Interpretative Statistical Survey of the World Christian Church*. The numbers of tourists visiting Jamaica—distinguishing stay-over and cruise tourists—are published in the annual report for the colony. An examination of those publications of the U.S. Department of Commerce, and of the U.K. Board of Trade, which deal with tourist expenditure in the balance of payments,<sup>4</sup> suggests that the stay-over tourists spent about £33 each in the island, the cruise tourists about £4 each—giving a total for 1938 of about £538,000 spent by tourists. A 'conservative' estimate, made by the West Indies Royal Commission, gave a tourist expenditure of about £407,000. The actual value of expenditure by tourists probably falls between these two at about £475,000.

The information available on emigrant labour consists of a few scattered estimates of the numbers abroad, and their average annual remittances, and the migration statistics. Lord Olivier, for example, estimated that there were

<sup>1</sup> See p. 103.

<sup>2</sup> See pp. 14-19 for a discussion of the differences between 'taxable national income', which has been defined to include these foreign firms as part of the Jamaican economy, and 'national income' which excludes their services altogether.

<sup>3</sup> The firms considered were the West Indian Sugar Co., Jamaica Public Services Ltd., United Fruit Company, and Standard Fruit Company. In the case of the largest of these (The West Indian Sugar Co. and United Fruit Co.) the relevant figure had to be estimated as a proportion of capital expenditure over a longer period, or a wider area.

<sup>4</sup> See U.S. Department of Commerce *Overseas Travel and Travel Expenditures in the Balance of International Payments of the U.S. 1919-1938*; *The Balance of Payments* (various years); U.K. Board of Trade *Journal*.



'upwards of 50,000' Jamaican labourers working abroad when he was Governor in 1907-13. Major Orde Browne quotes the Unemployment Bureau's estimate that the average annual value of total annual remittances from overseas in the period 1883-1935 was £125,000. Taking Lord Olivier's estimate of 50,000 as the probable number away in 1913, applying migration statistics, and allowing for death and permanent migration, we get about 46,000 for the number away in 1938. If the number abroad in 1883-1935 averaged about 75,000, as seems probable from the migration statistics, the average remittance per labourer abroad, on the Unemployment Bureau's estimate, was in the region of £1.67. Assuming that the average in 1938 was about £1.5 the remittances amounted to about £69,000. That this is a probable though conservative estimate is confirmed by the figure given to the Royal Commission of £50,928 as the value of money orders alone issued in the U.S. and canal zone and paid in Jamaica.

Only part of the government's expenditure abroad is distinguished in the official accounts. The remainder had to be estimated by arbitrary assumption as to the proportions of certain classes of expenditure (such as debt charges) which went abroad. Remittances abroad were calculated as for disinvestment by examining the available accounts of foreign firms.

Table 93 shows the results of these estimates before cross-checking.

TABLE. 93 Receipts from and expenditure abroad. The first estimate

Income generated by receipts from abroad	£,000	Current expenditure and investment abroad	£,000	£,000
1. Total value, domestic exports	4,930	7. Total value retained imports		6,272
2. Receipts from tourists	475	8. Government expenditure abroad		73
3. Receipts from foreign religious organisations	35	9. Remittances to foreign shareholders		622
4. Receipts from emigrant labour	69	10. Investment abroad	41	
5. Profits from abroad	205	11. Disinvestment abroad	1,356	
		12. Net foreign investment		1,315
		13. Total current expenditure and investment abroad		£5,652
6. Total income generated by receipts from abroad	£5,714			

The next stage was to adjust the items which were most weakly founded, in order to bring the table into what seemed to be the most appropriate balance. The adjustments were made to items 5, 9 and 10. Item 10 received the largest proportionate adjustment, because it seemed probable that part at least of the borrowing from abroad reflected in item 11 was not immediately put into active investment in Jamaica, but was merely transferred to the foreign credit of Jamaicans.

Table 94, which follows, shows the results of these changes in the form of a balance of payments constructed according to the taxable income definition of national income.

TABLE 94. The balance of payments

Income generated by receipts from abroad		Current expenditure and investment abroad	
	£000		£000
1. Total value domestic exports	4,930	7. Total value retained imports	6,272
2. Receipts from tourists	475	8. Government expenditure abroad	73
3. Receipts from emigrant labour	69	9. Remittances to foreign shareholders	649
4. Receipts from religious, etc., organisations	35	10. Investment abroad	66
5. Profits from abroad	195	11. Disinvestment abroad	1,356
		12. Net foreign investment	1,290
6. Total income from abroad	<u>£5,704</u>	13. Total expenditure abroad	<u>£5,704</u>

## PART V. CROSS-CHECKING THE ESTIMATES.

Having thus constructed three independent estimates of the taxable income of Jamaica in the form of an income, an output, and an expenditure table respectively, those estimates were set in single framework, together with the balance of payments, and used to check each other. To do this, it was necessary to exploit to the full the inter-connections of the economic system, by following them out in as much detail as the available material permitted. The process of cross-checking involved a breakdown of each estimate into its constituent items and a re-arrangement of these items to give new totals. In effect, by comparing in detail the estimates derived from these three independent sets of sources and the balance of payments (which was fairly independent) and by examining their implications for each separate item in the economic framework it was possible to throw new light on, and to revise accordingly, many of the original estimates. In this way each piece of evidence was forced to yield the maximum of information on the economic system as a whole, and was constantly tested by comparison with other pieces of evidence and the implications they suggested.

In Table 95, which follows, the final results of the cross-checking process are set out in some detail, and in a manner intended to illustrate the inter-connectedness of the economy, and to show to the full what changes have been made in the independent estimates in order to produce this single integrated body of estimates. The final result was one to which most of the manifold pieces of evidence pointed, and, unless there has been some serious omission or misinterpretation of the material which has been carried throughout the calculation, it seems probable that its margin of error is very much smaller than that which was attached to the independent estimates. An examination of the constituent parts of the total as set out in Table 95 shows clearly that the scope of probable variation is relatively limited—again unless there is some serious all-pervading error which has escaped the cross-checking process. In short, it seems probable that the margin of error in the final result lies somewhere between 6% and 10%.

Table 96 gives the final results in the form of an income-output-expenditure table, which can be compared directly with the original three sets of estimates. Table 97 gives a national income of residents table, and Table 98 gives the corresponding balance of payments.

TABLE 95. The national economy of Jamaica, 1938

	A	B	C	D	E	F	G	H	I	J	K
	Labourers' wages	Other wages and salaries	Profits	Interest	Rent	Total value of output	Imports	Exports	Available domestic-ally	Consumed	Invested
	£000	£000	£000	£000	£000	£000	£000	£000	£000	£000	£000
1. Bananas	1,839	—	428	71	162	2,500	—	1,952	548	548	—
2. Sugar and rum	900	90	352	55	44	1,441	—	1,000	441	411	30
3. Other exported crops						984	—	730	254	254	—
4. Livestock						743	—	10	4,626	4,626	—
5. Ground provisions and miscellaneous	300	25	2,146	140	1,299	2,183	1,710	—	—	—	—
6. Manufacture	158	16	160	14	34	382	4,562	30	4,914	3,514	1,400
7. Building and construction	350	20	250	30	—	650	—	—	650	250	400
8. Distribution	840	1,271	2,349	258	330	3,900	—	1,208	3,840	3,720	120
9. Transport						1,148	—	—	—	—	—
10. Baking	9	200	209	—	—	418	—	—	418	418	—
11. Newspapers and printing	6	55	30	—	—	91	—	—	91	91	—
12. Wood and cottage industries	5	30	120	—	—	155	—	—	155	155	—
13. Professions	6	234	390	10	2	642	—	35	607	607	—
14. Government	100	953	202	73	—	1,328	—	—	1,328	1,123	205
15. Domestic, hotels, entertainment, etc.	14	882	139	13	4	1,052	—	475	577	577	—
16. Miscellaneous personal services	9	286	296	—	—	591	—	—	591	591	—
17. Housing	—	—	—	—	1,847	1,847	—	—	1,847	1,847	—
18. Income from abroad	69	—	—	195	—	264	722	264	722	722	—
19. Totals	4,605	4,062	7,071	859	3,722	20,319	6,994	5,704	21,609	19,454	2,155
20. Less Capital import	—	—	—	—	—	—	1,290	—	1,290	—	1,290
21. Net totals	4,605	4,062	7,071	859	3,722	20,319	5,704	5,704	20,319	19,454	865
22. Less Foreigners' incomes	—	—	649	73	—	722	722	722	722	722	—
23. Net national totals	£4,605	£4,062	£6,422	£786	£3,722	£19,597	£4,982	£4,982	£19,597	£18,732	£865



TABLE 97. The income-output-expenditure table. The final estimate. Residents' income  
National income of Jamaica, 1938

Net national income	£000	Net national output	£000	Net national expenditure	£000
1. Labourers' wages	4,605	7. Net output of agriculture, livestock and fishing	7,802	14. Personal consumption at market prices	18,436
2. Other wages and salaries	4,062	8. Manufactures and construction	1,032	15. Subsidies	306
3. Profits from trades and professions	3,545	9. Distribution and transport	4,448	16. Less indirect taxes	2,281
4. Agricultural profits	2,877	10. Government service	1,255		
5. Interest and rent	4,508	11. Miscellaneous goods and services	4,796	17. Personal consumption at factor cost	16,461
		12. Income from abroad	264	18. Government current expenditure in Jamaica	2,271
				19. Government investment in Jamaica *	205
				20. Net private home investment	660
6. Total net national income	£19,597	13. Total net national output	£19,597	21. Total net national expenditure	£19,597

TABLE 98. The balance of payments. Final estimate. Residents' balance  
Balance of international payments of Jamaica, 1938

Income generated by receipts from abroad		£000	£000	Current expenditure and investment abroad		£000
1.	Total value, domestic exports		4,281	9.	Total value, retained imports	6,272
2.	Receipts from tourists		475	10.	Net foreign investment in Jamaica	1,290
3.	Receipts from emigrant labour		69			
4.	Receipts from religious, etc., organisations		35			
5.	Profits from abroad	195				
6.	Less profits and interest going abroad	73				
7.	Net receipts of profits and interest from abroad		122			
8.	Total net income generated by receipts from abroad		<u>£4,982</u>	11.	Total net current expenditure and investment abroad	<u>£4,982</u>

## CHAPTER VI

### THE NATIONAL INCOME OF JAMAICA, 1929-38

The second part of the enquiry into the national income of Jamaica consisted of an attempt to construct a ten-year series of national income estimates. The aim in this experiment was to find, for each main item in the national income tables, as already constructed for the year 1938, such information as would enable a reliable index to be formed, showing the movements in its magnitude over the nine years preceding 1938. Again, the three approaches to national income were to be considered separately, and the items were to be completely cross-checked so as to achieve for each year a fully integrated series of estimates which took all the available material into consideration.

It could not be claimed for these estimates that they are of a high degree of reliability. Two main sources of inaccuracy arise. First of all, there is the fact that the base year estimates are themselves extremely tentative. The totals, and even the main sub-totals arrived at for 1938, can confidently be regarded as being within 10% or so of the truth. The constituent items may in some cases be astray by some 50% or more. To carry them back for nine years, by means of even a reliable index of their fluctuations in value, is to imply a strength they do not possess and perhaps to magnify the effect of any distortions of the truth which were obscured in the 1938 estimates. Secondly, although the relevant material for national income estimates was scanty enough for the year 1938 it was still more flimsy for the preceding years. For very few items was it possible to draw up a satisfactory index of trend.

The alternative was to make a separate study, on the lines given in Chapter V, for each of the years 1929-37. As has already been noticed, the year 1938 was a particularly fortunate choice for a national income estimate, in that a Royal Commission and a Labour Adviser both visited the colony in that year, and reported in some detail on economic conditions therein. The further back one goes from 1938 the more difficult would it be to attempt a full-scale economic survey. The process would be time-consuming and the results not particularly satisfactory unless new information came to hand. On the other hand, there is only one way of avoiding the serious distortions which could arise from perpetuating unknown errors in the 1938 estimate, and that is to study each year separately and in detail.

The decision to use the rougher method to produce a historical series for the years 1929-38 was a result of the conclusion that, on balance, and given the known sources of data for the years preceding 1938, the saving in time more than outweighed the gain in accuracy which could be obtained from more detailed investigation. The decision to embark at all on such a tentative series of estimates originated in the belief that, for a dynamic economy, a picture which relates to a particular year is not enough. It is necessary also

to be able to trace past and present trends in the economic structure in order to use them as the chief source of evidence in any attempt to forecast future trends and to judge the effects of a given economic policy. The administrator charged with the task of formulating economic policy is constantly faced with the need to be aware of present economic trends and of potential future trends. Without adequate statistical material on the changes in the volume, nature and direction of national economic activity he must rely on being able to make general qualitative judgments on what is happening and what is likely to happen to the economy with which he is concerned. Even a rough attempt to record the changes in the national income, and its principal constituents over a period of time, is of some value in contributing to that judgment.

In particular, a method which utilises every possible cross-check obtainable from a limited amount of evidence, is as adequate a record of the changes as the administrator could hope to find. If the estimates which are attempted in this chapter do no more than achieve a systematic exploitation of the existing evidence for judgments on recent economic trends in Jamaica, they are of some practical value.

It is even more important, however, to be able to carry national income estimates forward in time and to keep the picture they present up to date. For a relatively advanced colonial economy such as that of Jamaica, and indeed for all colonial economies under the influence of the accelerated developments envisaged under the Colonial Development and Welfare Act, the economic structure can be expected to change rapidly and fundamentally in the coming years. However adequate and comprehensive is the economic survey which forms the basis of a given set of national income tables, they will in one, two, or three years' time relate to a different economy from that for which policy is being currently framed. Under present conditions, when very few colonial administrations have the staff necessary for an annual economic survey, it is important that the periodical detailed surveys, which are an essential to any kind of planned development, should be brought up to date each year, and that economic policy should be framed in full awareness of all the most recent developments.

There was thus a second object in view in attempting a ten-year series of estimates for Jamaica. It was hoped that such an experiment would throw some light on the kind of information that should be collected annually, if national income estimates are to be kept up to date, and on the adequacy of existing sources of annually-compiled returns.

#### SOURCES OF STATISTICAL SERIES FOR THE PERIOD 1929-38.

The principal sources of statistics covering the whole period 1929-38 were as follows:

(a) Import and export returns. These could be broken down into considerable detail and could be used to throw light on the relative fluctuations of many different items. For example, the amount of the banana exports gave an indication of relative changes in the output of bananas when combined



with an index of consumption. The value of imports of clothing was a fairly reliable guide to the fluctuations in expenditure on clothing. The net excess of imports over exports, after invisible items in the balance of trade had been accounted for, illuminated the movements in one of the principal factors contributing to total net investment in Jamaica, although net investment by Jamaicans had to be calculated from other sources. In all, the value of exports of merchandise were equivalent to about 24 % of the total estimated value of the national taxable income in 1938, and although it fell to probably under 15 % in 1933, it was always a significant factor in the total volume of the nation's economic activity.

(b) Income tax returns. The Income Tax Department classified assessed incomes under such headings as profits from trades and professions, profits from the working of estates, profits and interest from abroad, rents, casual profits, interest, official salaries, and unofficial salaries. It covered in 1939 nearly 23 % of the incomes estimated to have been earned in Jamaica in 1938 and, if we exclude labourers' wages, about 30 % of the other salaries and wages, and the profits, rents and interest. Thus, although the incomes covered by the assessment statistics may in some spheres be a valuable indication of the fluctuations in total value of incomes earned in Jamaica, they are limited enough in scope to make most generalisations suspect.

(c) Government accounts. Detailed central government and less detailed local government accounts were available for the whole period studied. Except in respect of the proportion of government debt service and pension payments flowing abroad, the central government accounts were as adequate as was required while local government activity could be traced in outline. Since total government expenditure was over 13 % of the estimated national taxable income in 1938, this was an appreciable contribution to the relatively reliable data on movements in economic activity between 1929 and 1938.

(d) Miscellaneous statistical series. Finally, there was a miscellaneous group of complete or incomplete statistical series of varying degrees of reliability or usefulness. Sugar production figures are collected annually, and estimates of average net return per ton to the sugar factories were supplied to the Royal Commission. The number of cruise and stay-over tourists visiting the island are regularly reported, and provide part of the information required for measuring an important item in the balance of payments. Incomplete series were available for the number of cattle slaughtered annually and the value of money orders issued to Jamaicans in the Panama Canal Zone. Note circulation figures, and statistics of tonnage entered and cleared from Jamaican harbours, could be used to confirm estimates in the changes of the volume of distribution and transport over the period, but were of limited value and might be seriously misleading on some points. Retail price statistics and a general price index,<sup>1</sup> and returns of the average wages paid to predial labour, artisans and domestic servants were also reported annually, but do not seem to be very reliable as a guide to fluctuations in the price level, or in the wage bill as a whole. Occasionally informa-

<sup>1</sup> See footnote <sup>2</sup> to Table 104, p. 141.

tion was available for a few years in the series, as in the case of the banana price statistics given in the Banana Commission's report in 1935.

It will be clear that the number of items which could be estimated over a period of ten years by means of direct and reliable indices of trend was very small. The final result for each year was the result of a combination of a number of very crude indices whose results were systematically cross-checked with each other.

In strict logic, if the three tables are to be independent and to provide a cross check on each other, the indices of change must be indices appropriate to the several columns; the output column must be adjusted by indices of output; the income column by indices of income; the expenditure column by indices of expenditure. In practice the available indices are few, and it has been necessary to sacrifice strict independence in order to complete the calculations. The three tables enable one, however, to derive from the limited stock of statistical data estimates of a greater range of subjects than could have been achieved without them, and, moreover, provide a certain degree of cross checking, so far as the partial independence of the series permits.

#### NOTES ON THE ESTIMATES.

1. The trend in the value of labourers' wages was found by using an index derived from the predial labourers' wage rates, as reported for each district in the Collector-General's reports, together with an index designed to represent the trend in employment. The employment index was usually an index of, or an estimated quantity of, output stabilised in part by a constant or regular factor such as a population index. This lack of a direct employment index was a very serious gap in the available information, and was a principal source of weakness in the income estimates.

2. Profits from the working of estates were attached to a trend which rested largely on the value of assessed incomes from the working of estates, but also had some relation to variations in the value of output of the commodity concerned. Profits from trades and professions were correlated directly, for most trades, with the assessed incomes from trades and professions.

3. For most other wages and salaries, and for interest and rent changes, the trend in assessed incomes, or deductions made from that trend, were applied. For government earners of salaries and other wages more direct information was available from official sources, and some indirect light could be shed from these sources on the relation of assessed to unassessed salaries in similar occupations. For distribution and transport the index of assessed unofficial salaries was combined with an index designed to represent the volume of trade. For domestic servants (including hotels and personal services, etc.) an index was compiled from a variety of sources, including the trend in unofficial salaries and in note circulation, together with the fluctuations in the average rate of wages paid to domestic servants, which could be calculated from the Collector-General's reports.

4. Income remitted from abroad by migrant labourers was correlated with the value of money orders issued in the Panama Canal Zone for payment in Jamaica. This, if the 1938 estimate was reliable, accounts for by far the greater proportion of the value of such remittances. Profits and interest, and income from abroad, were correlated with assessed incomes from abroad, which probably represents a fairly reliable index of fluctuations in this type of income. Other income items in the balance of payments were tourist expenditure and receipts from institutions of a charitable or religious nature. These latter, in default of any useful evidence, were assumed to be constant. They formed in any case, if the 1938 estimate is within 50% of the truth, and if there were no extraordinary receipts from this source, less than 1% of the total income generated by receipts from abroad. The value of tourist expenditure was found by using the official Jamaica statistics of stay-over and cruise statistics in combination with an estimate of the trend in average expenditure per stay-over cruise tourist from the United States and the United Kingdom. This involved the assumption that Jamaica's tourists came either from the United States or the United Kingdom, or spent at the same relative rate as tourists from the United States or the United Kingdom.<sup>1</sup> The assumption is probably not misleading, although it involves certain inaccuracies in the result. These figures, however, compare favourably with the rough estimates made at intervals by the Jamaica Tourist Board and published in various official publications.<sup>2</sup>

5. In compiling a set of indices for the output column over the years 1929-38 the main source of information was the import and export statistics, especially the quantitative data. For sugar (including rum and industrial alcohol) direct information was available in the Agricultural Department's reports on the quantity of output. The net value of sugar was estimated in an unpublished report made to the West Indies Royal Commission. For bananas, export figures were available, and a separate estimate was made for home consumption, based on the assumption of a fairly constant consumption of bananas per head over the whole period. For 'other exports' the export statistics were used, and for livestock estimates of the trend in output were made on the basis of such information as returns of cattle slaughtered, and of the number of goatskins exported. On matters relating to the output and prices of agricultural product, the *Journal of the Jamaica Agricultural Society* filled many gaps in the information given in the official reports. The weakest item in the agricultural section of the output column was the item called ground provisions and miscellaneous. For this it was necessary to construct an index of yield based largely on quantitative export statistics<sup>3</sup> and to combine it with an index of local food prices.

<sup>1</sup> The information for United States tourists, as reported in the official estimates of the balance of payments for that country, were more detailed than was the case for the United Kingdom, for which the *Board of Trade Journal* gave estimates.

<sup>2</sup> For example, in the *Economic Survey of the Colonial Empire*.

<sup>3</sup> The output of ground provisions and miscellaneous crops is presumably largely dependent on the factors affecting agricultural yield in general. To a lesser extent the quantities of agricultural products exported also fluctuates in response to the changes in agricultural conditions. In correlating the two series to give fluctuations in the output of ground provisions and miscellaneous crops, the assumption was made that the other factors affecting

6. The output of distribution was calculated as a separate item from that of transport.<sup>1</sup> An index for distribution was built up on such factors as the value of imports, the general price index and the note circulation. For transport, railway receipts, imports of car fuel and numbers of vehicles licensed, tonnage entered and cleared from Jamaican harbours, all formed the raw materials of an index of net value of output of transport over the period. For an index of the value of manufacture, factors taken into account were fluctuations in the value of exports of manufactures, and in the value of import of goods competing with Jamaican manufactures, and in the value of imports of goods estimated to be intended for industrial consumption by factories.<sup>2</sup> For the building and construction index, the main supports were the value or quantity of certain relevant imports, such as wood, or cement, or galvanised iron, making allowance for government consumption of such items.

7. There was a miscellaneous group of service industries, such as the professions, domestic service, entertainment and personal services, newspapers and printing, and wood and cottage industries, for which it was very difficult to construct any kind of index of value of output at all. For baking, flour imports constituted an important relevant factor. For newspapers and printing, imports of printing paper were relevant, but probably not highly significant. For domestic service, hotels and entertainment services, the tourist traffic was one factor, though perhaps only a minor one. Thus for the most part these services were assumed to fluctuate in value in roughly the same way as total assessed salaries, or as the note circulation, or as any other general trend which seemed most relevant to the industry concerned, together with whatever specific factors could be traced.

8. The personal consumption items of the expenditure column were carried back largely on the basis of import data. For food, an index was constructed which took account of the estimated quantity of output of local foods, plus the changes in the price index, and of the value of food imports. For clothing, imports were regarded as a sufficiently reliable guide to trend. For rent, assessed rents were accepted as an index. For other personal consumption expenditure, the total value of imports of goods intended for consumption rather than for industrial use was assumed to provide the relevant index. Except in the case of clothing, and perhaps also in the case of rent, this meant that trends in the personal consumption items were weakly founded. This was particularly important because these are large items. In 1938, personal consumption at factor cost was estimated to amount to over 80% of the total value of national taxable expenditure, and expenditure on food and 'all other' items, to over 75% of the personal consumption

changes in the quantity of exports—for example, the relative strength of effective demand—could be ignored. This is a very rash assumption. It is well within the realms of possibility not only that demand factors outweighed supply factors in determining the quantities exported, but also that the group of exported crops included an appreciable proportion which responded to climatic conditions in an opposite way to the ground provisions group. In effect, the assumption underlying the construction of this, the weakest of the indices, is justified only by a low probability.

<sup>1</sup> For the income approach to distribution and transport they were calculated together as a single item.

<sup>2</sup> Excluding sugar factories

section. The consequent weakness of the expenditure column as a whole meant that its value as a check on the income and output columns was very small indeed.

9. Foreign investment items and commercial remittances abroad were calculated first for the balance of payment and then, after they had been adjusted in accordance with that balance, were entered in the expenditure column. The net import of capital or foreign disinvestment was a residual item, after the visible and invisible items in the balance of trade had been estimated and reconsidered in the light of each other. Remittances to foreign shareholders were in the first instance estimated to follow the same trends as profits, weighted by the value of exports of bananas, sugar and rum, and other crops. Adjustments were subsequently made to these estimates after the completion of the balance of payments. Net Jamaican home investment was also correlated with profits, although this was necessarily a very rough approach. Foreign investment was estimated to be a small item following roughly the same course as profits from abroad, except that in 1938 there was a substantial jump in this item.

10. Government items in the expenditure column were calculated from the public accounts.

The total results obtained by these estimates for income, output, and expenditure, showed a fairly wide spread, indicating that they contain considerable errors. Table 99, below, gives these first totals.

TABLE 99. Taxable income, output and expenditure  
The first estimates for 1929-38

	Income £000	Output £000	Expenditure £000
1929	18,542	19,183	21,397
1930	18,105	18,932	20,554
1931	17,253	18,357	18,822
1932	16,595	17,119	17,532
1933	15,651	16,616	16,598
1934	15,978	17,003	17,230
1935	16,466	17,544	17,955
1936	17,370	17,617	17,440
1937	19,701	19,407	19,471
1938	20,319	20,319	20,319

The main factor producing the very high expenditure estimates for the earlier period appears to be the price indices which were taken into account in calculating this column. These indices are probably unreliable as a guide to the general price level. Another factor is the high volume of imports in 1929-30, which, judging from the estimated capital import,<sup>1</sup> was probably financed by borrowing. Thus, although the expenditure estimates created a presumption that there might be a tendency to underestimate the income and output estimates, particularly in the earlier half of the period, they were not strong enough to justify alteration of income and output estimates in favour of the expenditure cross-check. In effect, although income and output estimates were carefully, and comprehensively, cross-checked, and although

<sup>1</sup> See balance of payments, Table 101, p. 138.

in the course of the cross-checking process the higher expenditure results exerted an upward pressure on the estimates, there was no complete cross-check with expenditure.

The main weakness in the result is the fact that these tables of income, output and expenditure are even less independent in the series than were the original calculations for 1938. This is because the same indices have been applied to each table, in some degree. In particular, export and output statistics, on which the output table is based, have been used in calculating several items in the income table, e.g. labourers' wages, and import statistics on which the expenditure table is largely based, have been used for some items in the other two. The net result is that the output table is the most reliable and the income table is largely a derivation.

The final result for expenditure was based on the assumption that the results produced by cross-checking income and output were as accurate as possible on the existing evidence, and that the errors in the expenditure estimates lay in the items concerned with expenditure on food and 'all other' items.

The detailed results of all these estimates, after the completion of the income-output cross-checks, and the adjustment of items in the expenditure column, are given below in Tables 101-104. If it could be assumed that the 1938 estimates were accurate, the error in the totals for 1929-37 could all be regarded as lying within 12% of the truth. In fact, however, the 1938 estimates are not accurate, and the error in the totals for 1929-37 varies from about 20% in 1929 to about 12% in 1937. On the whole, the error increases as the estimates recede in time from 1938, which is the kind of result one would expect, both because there is more reliable information for the later half of the period and because the 1929 economy is bound to vary more considerably in structure from the 1938 economy than is the case for the nearer years. In effect, it is probably unwise to attempt to carry estimates more than four or five years forward or backward from the base year in view of the structural changes which take place in the economy through time. If the base year total is within 5% of the truth and its constituent items are also fairly reliable then, given more adequate indices of employment, trade, output, and prices than were available for Jamaica in 1929-38, it seems reasonable to expect that reliable and useful estimates with a margin of error of less than 10% could be rapidly produced at the above times for four to five years after a complete national income survey. Even where national income surveys of a detailed nature could be conducted annually, a rapid estimate at the end of each year would have the advantage of giving advance information to those engaged in the formation of policy.

The last of the tables at the end of this chapter gives the national income results in summary form together with some key indices.

Enough has been said already on the margins of error involved in the ten-year series of estimates to indicate that they can be used only with the greatest caution. Individual estimates can rarely be regarded with confidence outside their context, although for a few items (for example, sugar output, merchandise trade, and all items connected with the government) they are of a fairly

high order of reliability throughout the period. Even estimates of the trend in particular items—as opposed to estimates of absolute value—must be interpreted cautiously. Since, however, the margin of error in these estimates varies for different items, it may be of some value to those who wish to pursue the possibilities of economic analysis opened up by these tables to be given some indication of which constitute the strongest and which the weakest points in Tables 100-103.

Hence a brief note is added here on the items which are relatively strong and the items which are relatively weak. The strongest items are those for which the margin of error in the index of the trend is unlikely to exceed 10% for any year. The weakest are those in which the margin of error may exceed 20% in one or more years. On this definition the strongest items in Table 100 are 2, 5, 10 and 12; in Table 101 they are 1, 2, 10, 11 and 15; in Table 102 they are 2, 6, 7 and 9; and in Table 103 they are 1, 2, 4 and 8. The weakest items in Table 100 are 8 and 13; in Table 101 they are 3, 6 and 14; in Table 102 they are 4, 10 and 14; in Table 103 they are 3, 10 and 11.

TABLE 100. Taxable income of Jamaica, 1929-1938

	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938
	£000	£000	£000	£000	£000	£000	£000	£000	£000	£000
<i>Labourers</i>										
1. Banana labourers' wages	1,593	1,575	1,545	1,315	1,050	1,240	1,400	1,340	1,625	1,839
2. Sugar labourers' wages	581	598	450	500	500	588	590	671	800	900
3. All other labourers' wages	1,709	1,653	1,578	1,435	1,422	1,570	1,621	1,667	1,756	1,866
4. Total labourers' wages	3,883	3,826	3,573	3,250	2,972	3,398	3,611	3,678	4,181	4,605
<i>Salaries and other wages</i>										
5. From government sources	685	728	764	772	787	804	803	838	859	953
6. All other	2,779	2,788	2,689	2,613	2,461	2,601	2,582	2,622	2,775	3,109
7. Total salaries and wages	3,464	3,516	3,453	3,385	3,248	3,405	3,385	3,460	3,634	4,062
<i>Profits from trades and professions</i>										
8. From distribution and transport	2,196	2,089	1,925	1,821	1,640	1,651	1,788	1,897	2,373	2,349
9. From other trades and professions	1,687	1,595	1,573	1,500	1,460	1,418	1,518	1,650	1,795	1,796
10. Total profits from trades and professions	3,883	3,684	3,498	3,321	3,100	3,069	3,306	3,547	4,168	4,145
<i>Agricultural profits</i>										
11. Total agricultural profits	3,504	3,353	3,158	2,601	2,605	2,398	2,684	2,592	2,931	2,926
<i>Interest and rent</i>										
12. Interest	811	845	829	628	818	794	782	822	858	859
13. Rent	3,642	3,829	3,828	3,992	3,648	3,489	3,379	3,375	3,648	3,722
14. Total interest and rent	4,453	4,674	4,657	4,620	4,466	4,283	4,161	4,197	4,506	4,581
15. Total taxable incomes	19,187	19,053	18,339	17,177	16,391	16,553	17,147	17,474	19,420	20,319



TABLE 101. Taxable output of Jamaica, 1929-1938

	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938
	£000	£000	£000	£000	£000	£000	£000	£000	£000	£000
<i>Net output of</i>										
<i>Agriculture</i>										
1. Banana industry	2,225	2,220	2,100	1,865	1,400	1,650	1,905	1,800	2,240	2,500
2. Sugar industry	900	1,000	700	810	820	990	985	1,130	1,355	1,441
3. Other agricultural, livestock, etc.	4,450	4,375	4,400	3,850	4,000	3,600	3,800	3,725	3,900	3,910
4. Total agricultural	7,575	7,595	7,200	6,525	6,220	6,240	6,690	6,655	7,495	7,851
<i>Manufacture and building</i>										
5. Manufacture	330	300	285	320	330	310	323	400	400	382
6. Building and construction	600	550	475	395	415	500	525	500	650	650
7. Total building and construction	930	850	760	715	745	810	840	900	1,050	1,032
<i>Distribution and Transport</i>										
8. Distribution	3,700	3,600	3,350	3,155	2,900	3,000	3,050	3,200	3,700	3,900
9. Transport	1,000	1,000	950	945	900	1,000	1,100	1,100	1,195	1,148
10. Total distribution and transport	4,700	4,600	4,300	4,100	3,800	4,000	4,150	4,300	4,895	5,048
<i>Miscellaneous services</i>										
11. Government	1,125	1,175	1,185	1,180	1,200	1,195	1,165	1,195	1,235	1,328
12. Housing	1,975	2,000	2,000	1,920	1,850	1,745	1,660	1,640	1,810	1,847
13. Professional, baking, printing, cottage industries	1,250	1,200	1,200	1,150	1,130	1,110	1,135	1,160	1,250	1,306
14. Domestic, hotels, personal, etc.	1,300	1,300	1,350	1,300	1,215	1,220	1,250	1,250	1,400	1,643
15. Income from abroad	332	333	344	287	231	233	257	274	285	264
16. Total miscellaneous services	5,982	6,008	6,079	5,837	5,626	5,503	5,467	5,619	5,986	6,388
17. Total taxable output	19,187	19,053	18,339	17,177	16,391	16,553	17,147	17,474	19,420	20,319

TABLE 102. Taxable expenditure of Jamaica 1929-1938

	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938
<i>Personal consumption of</i>	£000	£000	£000	£000	£000	£000	£000	£000	£000	£000
1. Food	8,745	8,929	8,952	7,920	7,918	7,703	7,720	7,774	8,295	9,200
2. Clothing	1,852	1,815	1,389	1,671	1,234	1,598	1,580	1,690	2,050	1,814
3. Rent	2,390	2,460	2,458	2,322	2,139	2,123	2,010	1,989	2,188	2,239
4. All other goods and services	4,600	4,000	3,695	3,535	3,478	3,300	3,947	4,145	4,875	5,183
5. Total personal consumption at market prices	17,587	17,204	16,494	15,448	14,769	14,724	15,257	15,598	17,408	18,436
6. Less indirect taxes	1,804	1,689	1,596	1,596	1,550	1,596	1,600	1,735	1,963	2,281
7. Plus subsidies	352	371	303	245	288	346	349	278	235	306
8. Total personal consumption, at factor cost	16,135	15,886	15,201	14,097	13,507	13,474	13,916	14,141	15,680	16,461
<i>Government expenditure</i>										
9. Net current government expenditure	1,885	1,978	2,025	2,000	2,000	2,090	2,045	2,070	2,090	2,271
<i>Investment</i>										
10. Investment in Jamaica	2,749	2,447	2,051	2,059	2,243	2,049	1,783	1,895	2,003	2,155
11. Less net capital import	2,034	1,721	1,376	1,415	1,683	1,430	1,084	1,166	1,093	1,290
12. Total net investment	715	726	675	644	560	619	699	729	910	865
<i>Remittances abroad</i>										
13. By government	72	72	69	72	75	69	62	57	64	73
14. By commercial companies	380	391	369	364	249	301	425	477	676	649
15. Total remittances abroad	452	463	438	436	324	370	487	534	740	722
16. Total taxable expenditure	19,187	19,053	18,339	17,177	16,391	16,553	17,147	17,474	19,420	20,319

TABLE 103. Taxable balance of payments of Jamaica, 1929-1938

	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938
	£000	£000	£000	£000	£000	£000	£000	£000	£000	£000
<i>Receipts from abroad</i>										
1. Total value domestic exports	4,605	4,039	3,286	3,137	2,397	3,070	3,698	3,712	4,802	4,930
2. Tourist expenditure	300	355	266	241	282	319	326	367	466	475
3. Receipts from institutions	35	35	35	35	35	35	35	35	35	35
4. Receipts from emigrant labour	113	115	116	64	35	44	59	63	70	69
5. Profits from abroad	219	218	228	223	196	189	198	211	215	195
6. Residual items	92	77	63	50	33	43	42	29	5	—
7. Total receipts from abroad	5,364	4,839	3,994	3,750	2,978	3,700	4,358	4,417	5,593	5,704
<i>Expenditure and investment abroad</i>										
8. Total value retained imports	6,946	6,097	4,932	4,729	4,337	4,760	4,955	5,049	5,946	6,272
9. Government expenditure abroad	72	72	69	72	75	69	62	57	64	73
10. Remittances to foreign shareholders	380	391	369	364	249	301	425	477	676	649
11. Investment abroad	40	42	44	45	45	43	43	43	48	66
12. Disinvestment abroad	2,074	1,793	1,420	1,460	1,728	1,473	1,127	1,209	1,141	1,356
13. Total net current expenditure and investment abroad	5,364	4,839	3,994	3,750	2,978	3,700	4,358	4,417	5,593	5,704

TABLE 104. Jamaica, 1929-1938. Miscellaneous series and indices

	Net taxable income £,000	Net residents' income £,000	Index	Residents' income £ per head	Index of all assessed incomes <sup>1</sup>	Index of value of exports	Index of value of imports for home consumption	General price index <sup>2</sup>
1929	19,187	18,735	94	19.2	83	94	110	134
1930	19,053	18,590	94	18.6	85	81	97	128
1931	18,339	17,901	90	17.5	81	67	79	117
1932	17,177	16,741	84	15.8	80	64	75	109
1933	16,391	16,391	81	15.0	73	49	69	106
1934	16,553	16,183	81	14.7	76	62	76	101
1935	17,147	16,660	84	14.9	81	75	79	97
1936	17,474	16,940	86	15.0	85	75	80	90
1937	19,420	18,680	96	16.4	102	97	95	102
1938	20,319	19,597	100	16.9	100	100	100	100

These are attributed to the year in which they are estimated to have been earned, not the year in which they were assessed.

<sup>2</sup> This index is derived from the statement showing fluctuations of the Index Figure for the years 1923-1938 in Colonial Report No. 1896, 1939, *Annual Report on the Social and Economic Progress of the People of Jamaica, 1938*, p. 45. The prices and index figures for the following four groups are given in this and earlier reports, local foodstuffs, imported foodstuffs, clothing, etc., miscellaneous articles.

## CHAPTER VII

### CONCLUSIONS ON THE EXPERIMENT

The enquiry into the national income of the three selected colonial territories was conducted with several major objects in view. The first of these arose out of the long-felt need of those engaged in the analysis of national or international economic conditions and in the formulation of economic policy, for more uniform methods of national accounting. Official estimates of the United Kingdom national income began to be constructed, during the war, in the form of a system of balancing tables, which seemed greatly to facilitate economic analysis, and to reduce definitional problems to a minimum. It would be of considerable practical value to those engaged in the formulation or interpretation of colonial economic policy if colonial national income accounts were to be constructed, so far as possible, according to the same general pattern as has been adopted for the United Kingdom. Hence, the first object of the enquiry was to discover, by means of a practical experiment, whether the system of balancing national income tables, which characterises the official estimates for the United Kingdom, could be applied to an undeveloped economy such as that of a colony.

Secondly, if the method proved applicable at all, it was decided to attempt full-scale national income, output and expenditure estimates for the colonies of Northern Rhodesia, Nyasaland and Jamaica. The material for estimates was known to be deficient in all cases. These deficiencies proved a valuable testing-point for the experiment, however. If they permitted estimates of any value whatever, then there was already a strong case for making the need for national income estimates of this kind the centre of any general programme for the development of methods of collecting and presenting colonial economic statistics. If they proved an insuperable obstacle to the formation of even the crudest set of estimates, then the attempt would at least illuminate the deficiencies. In any case, it was certain that much would be learned about the most important deficiencies in the economic statistics of the countries concerned.

Thirdly, if the estimates could be completed they would throw some light on the structure and problems of the economies concerned, and would facilitate the task of economic analysis in respect of these three colonies. The need for accumulating information on economic conditions in the three colonies, and of presenting it in an intelligible form, was prominent among the objects of the enquiry. It requires special emphasis here, if only because the preceding chapters have been exclusively concerned with the practical and methodological problems of making the estimates, and have neglected their potential applications in the form of direct economic analysis.

Fourthly, in making the estimates, an attempt was made, in each case, to evolve a framework of national accounts which was suitable to the economy whose productive activities the estimates were designed to reflect. There

was no reason to believe that the framework which proved suitable to an economy such as that of the United Kingdom was, in all its details, suitable to a fundamentally different economy. This is a special aspect of the general problem of applying a modern method of national income measurement to an undeveloped economy. Differences in the social and economic structure of each colony demand different methods of drawing up and presenting national income tables. Hence, even where the method used in the United Kingdom proved applicable in all essentials, it remains necessary to adapt it in detail to the needs of the colony concerned.

Fifthly, the possibility of producing a historical series, and perhaps of keeping estimates up to date without comprehensive annual surveys, was to be investigated by an attempt to produce estimates for Jamaica covering a period of ten years. A national income estimate for one year only is an inadequate tool of analysis for a dynamic economy. It may give a picture of the volume and structure of economic activity, but it gives little guidance, if any, on how long this picture can be regarded as true to life, and on how it can be expected to react to changes in conditions. The attempt to construct a historical series represents the first stage of an enquiry into the dynamic elements in the economy, and into their probable influence on its future experience. The second, and more important stage, in such an enquiry would be the systematic annual construction of estimates which would keep the national income figures up to date. Methods used in constructing a historical series might give practical guidance on methods of keeping estimates up to date.

As a result of the experiments which have been described in the preceding pages, some solution can be found to the problems set by the enquiry. To the first of these problems a clear, affirmative answer was reached. If there were any available data on economic conditions in a given colony, there was every advantage to be gained by an attempt to give them systematic expression in the form of a series of balancing national income tables.

However rough the estimates which form the basis of the tables, these can be used to show, at a glance, the sources from which the community draws its wealth, the distribution of that wealth amongst the various sections of the community, and the forms in which it is consumed or invested.

It is true that, for some sections of a backward economy, it was impossible to draw up income, output and expenditure accounts on the lines appropriate to a more advanced economy. In particular, the rents, profits, interest, salaries, and wages of a community producing for exchange have no counterpart in a community of subsistence producers. It is characteristic of a backward, agricultural economy that some part of output is subsistence output, and that, as a result, only output, and consumption or saving, can be distinguished for the purposes of the national accounts. Subsistence income and output are identical, since money income is peculiar to the exchange economy. Nevertheless, there is no pure subsistence economy, even in the Central African colonies. Although in Northern Rhodesia and Nyasaland the scope and volume of subsistence production is considerable, it proved not great enough to invalidate the balancing tables as a system of national income

measurement. In principle and in its main essentials, the method seemed as applicable to Northern Rhodesia and Nyasaland as to the United Kingdom. There were no important theoretical obstacles in the way of its application to Jamaica.

The second main object of the enquiry was to construct a set of balancing national income tables for each of the three colonies selected for study. The material for this purpose consisted largely of the published, but also of some unpublished, documents which were available in the United Kingdom at the time the estimates were made. Only for Northern Rhodesia was this supplemented, to any significant extent, by information obtained directly from sources within the colony. In practice, it proved impossible to compile a complete set of reliable estimates for any of the colonies, so inadequate was the material for estimate. All that could be done was to make all the convincing estimates that could be made, and to use them to check, directly or indirectly, not only each other, but also the large number of guesses which had to be recorded in order to complete the balancing tables.

There is no doubt that the need to resort so often to guess work in calculating the value of those economic activities, about which the reliable information was vague and imprecise, left grave weaknesses in the final tables. This was especially true of the details, some of which could only be checked indirectly, if at all. Nevertheless, it was soon clear that the three-fold method of approach, although it involved the construction of many unreliable estimates, made the most of scanty material. The details of the pictures drawn in the fundamental tables at the end of each of the four preceding chapters must be interpreted with extreme caution, unless the text shows them to be well supported, both in respect of the reliability of the information on which they are based, and in the cross-checks between the various items. In very few cases is it possible to extract a figure from its context, and to use it as a reliable basis for economic analysis. On the other hand, the totals and the principal orders of magnitude, although they are not accurate, can be used with some confidence, because they are based on the accumulated evidence of many pieces of information collected from a variety of independent and unrelated sources.

It is true that all national income figures are estimates subject to a margin of error, even the official figures published for the United Kingdom. Until a country's statistical reporting system covers, directly, every economic activity, it will always be necessary to estimate the national income and to expect some margin of error. As a country's methods of reporting and handling economic statistics improve, its national income estimates can be progressively refined. In practice, it is not necessary for most purposes of economic analysis and policy to know the value of the national income and its constituent items with complete accuracy. An estimate in which the totals and the principal details have a margin of error not exceeding 5% is sufficiently accurate for most practical purposes.

Throughout the experiment, attempts were made to calculate the margin of error involved in the successive estimates. Most of these results have been detailed in the text of Chapters III-VI. For Northern Rhodesia the total

national income estimates were believed to be subject to a margin of error of less than 10%. For Nyasaland, it was estimated to fall between 15% and 20%. The margin of error attributed to the Nyasaland total is more typical of what might be achieved for other Central African colonies with such limitations of data and method. The Northern Rhodesia totals have a greater appearance of reliability than the Nyasaland totals, because so large a part of the total value of economic activity was due to the well documented operations of the giant mining companies. For Jamaica, the margin of error in the 1938 estimates was put at about 8%, and in the ten-year series it varied between 12% and 20% for different years. In all cases many of the constituent details were subject to a wider margin of error, some of them of the order of 50% or even more.<sup>1</sup>

From this it can be seen that the national income calculations made in this experiment are of a different order of reliability to the estimates on which observers in countries such as the United Kingdom or the United States of America are accustomed to base economic analysis and policy. This was to be expected. Nevertheless, given the abnormally scanty material<sup>2</sup> which was available, it may be thought, not that these margins of error have been pitched too high, but that they are too low.

It is the opinion of the author that these are conservative estimates of the reliability of these results. It must be emphasised, however, that the estimates of the margin of error are themselves highly subjective. An investigator who generally regards the material available for estimates in an optimistic light will tend to under-estimate the margins of error involved. Conversely, the investigator who invariably regards his basic material with suspicion will over-estimate the margins of error involved in his results. Without knowing exactly how far one's stock of data falls short of the ideal, it is not possible to attribute an exact and final margin of error to the results obtainable from inadequate data. It will be appreciated that the subjective quality of estimates of the margin of error is particularly important in a case where the enquiry is conducted at a distance from the economy concerned, and by an investigator without first-hand knowledge of the country.

Moreover, in estimating the margin of error it is not possible to take account of all sources of error. Only those potential errors due to the inadequacy of the data can be given quantitative expression, however rough. There may be errors of logic in the results. For example, some items may have been counted twice in the same column of the income-output-expenditure table. Some items may have been excluded as being transfer payments, when in fact they represent genuine income and should have been included. Akin to the possible errors of logic are errors of evaluation. The prices which were used

<sup>1</sup> This paragraph on the margins of error involved in the estimates should be read in conjunction with the account given in Chapter I, pp. 4-5, of the principles used in assessing the reliability of the estimates.

<sup>2</sup> In each of the colonies the material on economic conditions has improved since 1938. Moreover, a similar estimate made by an official agency with unrestricted access to all official sources, and with opportunities of collecting new and direct information, would undoubtedly produce a more reliable result. It is perhaps significant that Dr. Benham puts the margin of error in his estimate of the national income of Barbados as low as 1%. This may be optimistic for estimates which apparently do not utilise every possible cross-check, but it does not seem unreasonable. (See *Development and Welfare Bulletin No. 9*, p. 1.)



to evaluate African subsistence agriculture may not prove to be prices which another investigator would accept, or which reflect most appropriately the community's scheme of values. These are errors of judgment which the investigator cannot be expected to insure against in stating his margin of error.

In effect, all that is implied, for example, by the statement that the estimate of the national income of Northern Rhodesia in 1938 is subject to a margin of error of less than 10%, is that the investigator is satisfied that, if complete data for making the estimates become available, the improved estimates would not differ from the results already obtained with inadequate data by as much as 10% at the outside.

The conclusion that emerges from the estimates of margins of error made during this experiment is that there remains an urgent need for more accurate estimates of national income on these lines, for each of the three colonies. At best, the estimates made here extract the fullest possible amount of information from existing sources of material on economic conditions and present it in a form suitable for most purposes of economic analysis. The available data proved quite insufficient to permit the formation of any but the roughest and most general impression of most forms of economic activity in the Central African colonies. For Jamaica there were fewer important gaps to be filled by guess work, but the degree of uncertainty was still large. In each case, the general picture is probably free from serious distortion, but the details are generally too inexact to provide a clear outline of the economy. There is little doubt, however, that a satisfactory set of national income estimates could be obtained for each of these three colonies, provided that more basic information on economic conditions were collected.

The difficulty with which the national income investigator is faced in many colonies, given the existing stock of economic statistics, is that the most important spheres of economic activity are unsystematically documented, and that, for some spheres, there is not even enough information to make the order of magnitude a certainty. It was characteristic of the material for Northern Rhodesia and Nyasaland that the data available for an estimate of the value of African agriculture, perhaps the most significant single item in the national income of both colonies, were largely qualitative. On the Northern Rhodesian maize harvest, for example, little more was known than that it was 'good' in some areas, 'excellent' in others and 'poor' or 'very poor' in others. The normal range of maize yields in each district had to be deduced from an incomplete miscellany of sources. On this partly qualitative, partly quantitative, basis a loose structure of assumptions was reared towards the final result. For Jamaica, there had not been a census since 1921 and the results of the 1942 census came to hand too late to be fully and effectively utilised. Estimates relating to the occupations of the people were thus weak for all but the few industries which were well documented.

To produce a satisfactory set of national income estimates<sup>1</sup> for any colony,

<sup>1</sup> For example, national income tables in which the totals and all the main sub-totals have a margin of error of less than 10%, and in which no significant detail is subject to a margin of error of as much as 20%. This is a low standard of accuracy, too low for the more developed colonies such as Jamaica, but within the immediate reach of Northern Rhodesia or Nyasaland.

it is necessary to have certain kinds of basic information on the economy as a whole and on all important forms of economic activity.

An estimate of national income for the income column requires the results of a recent census, including an occupational classification, together with enough up-to-date information to permit the census results to be adjusted for the year studied. Wage and salary statistics covering the principal industries in detail, and the whole economy in outline, are essential, and should be supplemented with relevant data on incomes in kind, and time worked per annum, for all the principal income groups. Profits, and other incomes assessed to tax, should be analysed according to size of income, residence of recipient (at home or abroad), and industry from which the reward was drawn.

For the output column, land utilisation statistics showing the proportion of land under each crop, and yield statistics relating to the year studied, or which can be adjusted for each year's harvest, are the first essential, together with the prices of agricultural products to the grower. Company reports should be collected from all companies which publish them and for other industries information on the number of productive units (factories, shops, lorries, etc.), the value of raw materials, and the value of gross output should be directly collected. Where there are too many units to permit the collection of information from each one it may be necessary to survey a representative sample.

For the expenditure column, retail sales statistics covering the principal items of consumption, together with family budget data, and information on new investment in fixed capital or stocks or foreign securities are essential to the formulation of a satisfactory independent estimate.

In effect, in order to obtain the fullest possible advantage from the cross-checks obtainable by the triple approach method of measuring national income, it is more useful to obtain the basic information for each of the three columns, rather than to collect relatively full information on any one column.

It will be seen that the efficient compilation of national income statistics calls for the systematic collection of two kinds of statistical data. The first are the data obtainable through a special survey, whether a general survey, such as a census or an ecological survey, or a sample survey, such as a family budget enquiry, or an earnings enquiry for a particular industry, or a yields enquiry for a particular district. Generally, a special survey will give results which can be used, with minor adjustments, over a period of years. The second type of statistical data consists of information collected annually about the principal variables in the economy—prices, wages, profits, harvest results, sales statistics, and similar data. There is a strong case for conducting as many of the special surveys as possible in the same year, and for keeping them up to date by routine annual returns of key statistics for a period, not exceeding ten years. There would then be one set of firm national income estimates at least every ten years, and annual estimates, of a progressively falling standard of accuracy, for the intermediate years.

In compiling a ten-year series of estimates for Jamaica, an attempt was, in effect, made to carry the results of a base year backwards by means of a series

of indices. The conclusions reached, as a result of this experiment, were three-fold. First, it was clear that such a series had a great deal of interesting information to offer. It showed, for example, which sections of the community felt the impact of the depression most, and which industries showed most resilience. Thus, it revealed the responses in the economic structure to changes in the volume and direction of economic activity and it illuminated certain current trends. For example, it was clear that the industry which suffered most from the world economic depression was the sugar industry. This was not surprising, in view of the fact that home consumption is only a small proportion of total output and the world price of sugar fell heavily in the depression; the value of sugar output in 1931 was as much as 50% below the 1938 level. The banana industry was less affected by the slump, but it experienced its own disaster in the 1933 hurricane, which reduced the value of its output to about 56% of the 1938 level. Moreover, the fortunes of the banana industry seem to reflect more faithfully the changes in the island's prosperity over this period than was the case for other important industries. 1933 was the bottom of the Jamaican slump. Rising factors in the Jamaican economy over this period were the sugar industry and the service industries, particularly the domestic, personal and entertainment industries. Falling factors were the value of agricultural products in general, other than bananas and sugar, and of subsistence products in particular, while expenditure on imported goods rose, and agricultural profits fell, in sympathy. These and all other movements in the structure of the economy must be considered in the light of changes in the price level.

Secondly, it seemed that an attempt to carry estimates back from a base year for more than five years may lead to some very doubtful and perhaps distorted results, unless the statistical series available on an annual basis prove adequate to cover all major movements in the structure of the economy. This is the more true, the more rapidly the economy is developing and changing shape. Finally, it seemed that relatively few statistical series were required to bring an estimate up to date in respect of its total and its main sub-totals. The series must include certain key statistics, however, such as employment and wage statistics, the principal output and sales data, and a full set of prices. Given that the base year estimates are within 5% of the truth and that no attempt is made to extend the series beyond about five years, it should be possible to construct annual income, output and expenditure estimates with a margin of error not exceeding 10%. If the series is to be extended for as much as ten years, and if it is to be valid in detail, both the base year estimates and the annual estimates must be constructed on the basis of correspondingly fuller data.

The fact that the estimates made in the course of this experiment are subject to a considerable margin of error, means that any attempt to use them as a basis for economic analysis requires the exercise of considerable caution. Nevertheless, even these crudely calculated tables enable one to formulate with confidence a number of useful conclusions concerning the economy and its structure. The more accurate the estimates, of course, the more searching and detailed are the conclusions which can be drawn.

## SOME APPLICATIONS.

1. A glance at the income column in each of the fundamental tables shows how the national income is distributed among the different groups of income receivers. In all three cases they give evidence, for example, of the characteristically dependent nature of a colonial economy. Table 105, below, which summarises this evidence illustrates two forms of dependence. It shows, first, how dependent are some colonial peoples on employment opportunities abroad or on grants from the United Kingdom government. This emerges from the relative magnitude of income flowing from abroad. Table 105 shows also how dependent is colonial industry on capital supplied by foreigners. This reveals itself in the size of the flow of dividends and undistributed profits to companies registered outside the colony.

TABLE 105. Degree of dependence of the selected colonial economies

	Percentage of total taxable incomes <sup>1</sup>		
	Northern Rhodesia	Nyasaland	Jamaica
	%	%	%
Remitted from abroad	1	6	1
Received by foreigners	42	12	4
Earned in colony by residents	57	82	95

This feature of the colonial economies would repay closer study. In Nyasaland, for example, it was estimated that about 13% of the cash income of Africans was received in the form of remittances from migrant labourers.<sup>2</sup> The total earning power of these absentee labourers was, of course, many times greater. Only their remittances have been calculated as part of the Nyasaland income. In Northern Rhodesia, little more than a third of the net output of the territory's most valuable industry—mining—could be attributed to residents, and only about 10% was earned by Africans.<sup>3</sup>

2. It is not the purpose of this study to analyse the results of the national income estimates or to draw the appropriate conclusions for economic policy. A full analysis would, for instance, reveal the weaker spots in these economies in a way useful to those responsible for economic planning. A few examples which reflect some of the main characteristics of the economic systems of these colonies can, however, be given.

The most striking feature of the Central African economies, as revealed by the income section of the national income tables, is the distribution between Europeans and Africans. Table 106 shows the proportions earned by Europeans, Africans, Asiatics and the government, respectively, in Northern Rhodesia and Nyasaland. Of Northern Rhodesia's total taxable income of nearly £10 per head, only about 25% went to Africans, and, of Nyasaland's taxable income of under £3 per head, about 61% went to Africans. This

<sup>1</sup> i.e. of all incomes earned in the colony or by residents of the colony.

<sup>2</sup> See Table 50, p. 73.

<sup>3</sup> See Table 32, p. 52.

difference reflects, of course, the very different degrees of development with foreign capital.

TABLE 106. Distribution of national income between different races

	Percentage of total income			
	(a) Northern Rhodesia		(b) Nyasaland	
	Taxable income	Residents' income	Taxable income	Residents' income
	%	%	%	%
Europeans	73	49	27	17
Africans	25	40	61	69
Asiatics	1	1	4	5
Government	1	10	8	9

3. A consideration of the income distribution amongst the various races leads naturally to a consideration of their relative tax contributions. In Table 70 the direct taxes paid by the different races are set out separately for Nyasaland.<sup>1</sup> Europeans and Asiatic residents paid, in effect, about 2% of their total incomes in direct taxes, while European foreigners (i.e. companies registered abroad) and Africans each paid about 5% of their income. The European companies registered abroad also paid about as much again in United Kingdom income tax. The relatively heavy burden borne by Africans is an unfavourable reflection on the tax system and deserves further consideration. Indirect taxes must also be taken into account. The expenditure column shows that about £236,000 was collected in indirect taxation. An attempt to break down expenditure of Europeans, Asiatics and Africans into greater detail suggests that the Africans paid the bulk of the indirect taxes, largely in taxes on clothing and similar items. Since, however, the Africans' payments of indirect taxes are much smaller relatively to their total income than is the case for Europeans, the final conclusion is that resident Europeans and Asiatics paid not less than 16% of their income in taxation to the Nyasaland government, while Africans paid not more than 10% of their income. This avenue of research could be further pursued by considering the share of the different races in the expenditure of government. Enough has been said, however, to indicate the kind of practical information which the income columns can be made to yield and the kind of problems for whose solution they can prove a valuable starting point.

4. From the output columns can be learnt the industrial structure of the economies studied. In Table 107, for example, the proportion which each industry contributes to the net national output is compared for the three colonies with the relevant proportions estimated for the United Kingdom. As was to be expected, agriculture occupies an important place in the economic structure of each of the colonies, although in Northern Rhodesia it is second to mining. Income from abroad in Northern Rhodesia includes remittances from migrant labour and income tax from foreign companies. For Nyasaland it includes both remittances of migrant labour and grants from H.M. Government in the United Kingdom.

<sup>1</sup> See p. 89.

TABLE 107. The structure of net national output, 1938<sup>1</sup>

	United Kingdom <sup>2</sup>	Northern Rhodesia <sup>3</sup>	Nyasaland	Jamaica
	%	%	%	%
Agriculture and fishing	5	24	58	40
Mining	3	30	—	—
Manufacture and building	42	5	4	6
Distribution and transport	19	15	11	23
Government service	9	8	11	6
Dwelling houses	5	5	4	9
Income from abroad	5	9	7	1
Finance, professional and personal services	12	4	5	15

The most striking feature about the industrial structure of Jamaica, apart from the relative importance of distribution and transport in particular, is the high proportion of net national output which is attributable to the tertiary industries.<sup>4</sup> This is unexpected, because the importance of the tertiary industries is often claimed to be an index of the national standard of living. Colin Clark puts forward this hypothesis in *The Conditions of Economic Progress*. He says: 'Studying economic progress in relation to the economic structure of different countries, we find a very firmly established generalisation that a high level of real income per head is always associated with a high proportion of the working population engaged in tertiary industries . . . low real income per head is always associated with a low proportion of the working population engaged in tertiary production and a high percentage in primary production.'<sup>5</sup>

It is not the same to say that a high proportionate value of tertiary production indicates a high standard of living. Nevertheless, it is suggestive and interesting to find that Jamaica with a net national income of about £17 per head has a higher proportionate value of tertiary production than the United Kingdom with a net national income of over £90 per head.<sup>6</sup> The explanation may lie in the agricultural overpopulation of Jamaica.

5. Finally, it may be of some interest to pick out the salient features suggested by the expenditure columns of the fundamental tables constructed in the course of this enquiry. For Jamaica, the features which excite most comment include, first, the high proportion of personal consumption accounted for by the value of food. In 1938 the value of the personal consumption of food and drink was about 50% of all personal consumption valued at market prices. The comparable figure for the United Kingdom was about 35%, of

<sup>1</sup> The proportions for the United Kingdom relate to 1937.

<sup>2</sup> These proportions are based on Mr Barna's estimates given on p. 58 of *Redistribution of Income Through Public Finance in 1937*, Oxford, 1945.

<sup>3</sup> The item called 'Income from abroad' in this column differs from the corresponding item in Table 105, because in this table the foreign companies are regarded as being 'abroad', and in Table 105 they are treated as being within the economy of Northern Rhodesia. Hence in Table 107 their tax payments are receipts from abroad.

<sup>4</sup> Primary industries include agriculture, forestry, fishing; secondary industries include mining, manufacture and building; tertiary industries include distribution, transport, services and all other economic activities.

<sup>5</sup> *The Conditions of Economic Progress*, by Colin Clark. London, 1940. P. 7.

<sup>6</sup> The net national income of the United Kingdom in 1938 was estimated at £4,619 millions in 1938. See the Treasury White Paper, Cmd. 7099, for estimates covering the years 1938-46. In 1938 the average national income per head of persons in the United Kingdom was about £97.

which over 18% was due to expenditure on alcoholic beverages.<sup>1</sup> A second significant item in the expenditure column for Jamaica is the high value of borrowing from abroad. This is a particularly interesting feature of the ten-year series.

In the African colonies, the most striking feature of the expenditure column was the value of the expenditure of residents abroad. This represents the homeward remittances and leave pay, etc., of immigrants, whether Europeans, Asiatics or non-native Africans. In Nyasaland over 4% of the residents' income, or about £183,000, was estimated to have been spent outside the colony, 80% by Europeans. In Northern Rhodesia the expenditure abroad of Europeans was estimated to amount to over 9% of the residents' income.

The few comments on the economies of Northern Rhodesia, Nyasaland and Jamaica which have been made in this section are not intended to be in any way exhaustive. In fact, they barely touch the fringe of the possible field of economic analysis opened up by these and similar tables. Nevertheless, they may show some among the many uses to which national income tables of this nature could be put.

#### CONCLUSION

In the task of evolving a special framework suitable to the economies for which the national income estimates were constructed, the experiments produced a less definite result. For Jamaica no very serious problems arose. The Jamaican economy could apparently be fitted to a framework constructed largely on the lines of that for which the balancing tables were originally evolved. As a result, the Jamaican tables are very similar in presentation to the official United Kingdom estimates, although detailed direct comparisons are rendered difficult by the differences in the social and economic structure of the two economies.

In working out national income tables for the Central African colonies, however, it soon became clear that a more comprehensive and direct knowledge of the social and economic structure of Central African peoples was essential if a satisfactory framework was to be evolved. Decisions could be taken on some of the logical problems with a fair degree of confidence. It was possible to decide that the concept of taxable income should be regarded as of equal importance with the concept of residents' income, to which attention is normally confined in estimates made for the United Kingdom or the United States of America. The decision appeared to be applicable to any economy where the value of the activities carried on within its borders was appreciably different from the value of the incomes earned by its nationals.

It was possible also to make the decision to abandon the income classification according to profits, interest, rents, wages and salaries, and substitute

<sup>1</sup> This comparison bears out another generalisation relating to the standard of living, viz. Engel's law, which claims that, as total income rises, the proportion spent on the necessities of life falls.

a classification according to nationality. This decision appeared to be applicable wherever the undeveloped nature of the economy made it difficult or inappropriate to distinguish profits, interest, rents, wages and salaries, and where the various national groups within the community were readily distinguishable. Where the groups overlapped and there was an appreciable section of the community which could not be fitted unambiguously into any one national or racial group, this principle of classification would be difficult to apply. Where each immigrant community is socially and economically exclusive to a predominant degree, as is the case for the Europeans, Africans, and Asiatics, in tropical Africa, then the distinction between them is both useful and practicable.

There were many problems, however, to which the solution could not but be tentative. The problem of evaluating untraded output, for example, assumed formidable proportions in an economy with an important section of subsistence producers, and with large areas which were only lightly influenced by the exchange economy. The problem of drawing the line between goods and services of an 'uneconomic' kind, which ought to be excluded from a national income calculation, and goods and services which, though not traded, are logically part of total economic activity, was peculiarly difficult for an economy where so many goods and services are produced not for the market, but for home consumption. Which, for example, of the whole range of women's activities, from tilling the ground to collecting firewood or preparing meals, should be regarded as economic and which as domestic activities?

A temporary solution to many such problems was imposed by lack of data. In any case, the problem of distinguishing between economic and uneconomic activities for a community which might not recognise such a distinction is soluble only in the field. This is the next stage of the enquiry. It is to evolve the most suitable economic and social framework for African national income statistics that this enquiry is to be pursued in the field, as well as to achieve more accurate and up-to-date results, and to experiment in direct statistical reporting methods for national income purposes. In effect, the last stage of the enquiry is to take the form of a local investigation into the national incomes of Nyasaland and Northern Rhodesia for the latest fully documented year, followed by an attempt to bring it up to date for the succeeding year.



## APPENDIX I

### THE PRELIMINARY ESTIMATES FOR NORTHERN RHODESIA

The experiment in constructing national income tables for Northern Rhodesia was conducted in two stages. First, a set of preliminary estimates was made on the basis of the material that was available in the United Kingdom. Then these estimates were circulated to informed observers in the territory for their comments and criticism. On the basis of the replies that were received, and on new information which came to hand since the compilation of the preliminary estimates, a set of revised estimates was drawn up and it is these that are described in Chapter III.

The amount of new information that was obtainable in this way was, of course, limited. In the first place, we were asking observers to comment in 1944 on estimates relating to 1938. Fortunately, much of the basic information that was required—for example, information on agricultural yields and practices—was not highly variable from year to year. Secondly, the persons to whom the draft was sent for comment were, without exception, fully burdened with the extra work and staff shortage problems imposed by the war. In view of these difficulties the response which was received to the request for criticism was very encouraging. In particular, the revised estimates owe a great deal to the generous expenditure of time and effort made by Dr. Max Gluckman, Mr. N. S. Carey-Jones, Mr. C. G. Trapnell, and Lieutenant Godfrey Wilson. In the United Kingdom, Dr. Audrey Richards was a constant source of information and advice, not only at this stage, but also while the preliminary estimates were being constructed. To the corrections and improvements suggested by critics who had read the preliminary estimates were added substantial amendments which arose out of the handling of some fresh information, of which the most important source was the Ecological Survey covering North-Eastern Rhodesia.

As a result of the revisions thus made possible considerable changes were effected in the preliminary estimates. These are illustrated in Table 108, which sets out the two groups of estimates side by side. It will be seen that the change in the total amounts to less than 3%, but that the detailed changes are of a different order of magnitude altogether. The change for African subsistence income amounts to an addition of over 50%. The change for the output of government services item amounts to an addition of nearly 100%, due to a logical error in the original estimates.

In sum, therefore, the effect of circulating the preliminary estimates for informed comment was to confirm some estimates and improve others. Many of the errors appeared to cancel each other and, although the change in the total result was not great, the margin of error attributable to it was roughly halved.

TABLE 108. The taxable income of Northern Rhodesia. Preliminary estimates compared with revised estimates

Total taxable income	Preliminary Estimates £m	Revised Estimates £m	Total taxable output	Preliminary Estimates £m	Revised Estimates £m	Total taxable expenditure	Preliminary Estimates £m	Revised Estimates £m
1. European individuals, resident	3.60	3.77	<i>Net output of</i>	7.76	7.35	<i>Personal consumption of</i>	2.74	3.01
2. European companies	6.19	5.95	9. Mining	0.22	0.20	22. Europeans	2.94	3.27
3. African subsistence income	1.08	1.66	10. European agriculture	1.54	1.80	23. Africans and Asiatics		
4. African cash income	1.94	1.74	11. African agriculture			24. Total personal consumption at market prices	5.68	6.28
5. Asiatic incomes	0.07	0.07	12. European manufacture (including forestry)	0.26	0.18	25. Less indirect taxes	0.47	0.46
6. Government incomes plus	0.12	0.17	13. African manufacture	0.06	0.11			
7. Residue	0.02	—	14. Housing and construction	0.54	0.53	26. Total personal consumption at factor cost	5.21	5.82
			15. Distribution	0.67	0.75	27. Government current expenditure	0.87	1.07
			16. Transport	1.10	1.07	28. Investment	0.75	0.69
			17. Income from abroad	0.10	0.10	29. Remittances and expenditure abroad	6.16	5.78
			18. Government	0.48	0.94	30. Residue plus	0.03	—
			19. Miscellaneous other services	0.33	0.33			
			20. Residue less	0.04	—	31. Total taxable expenditure	£13.02	£13.36
8. Total taxable income	£13.02	£13.36	21. Total taxable output	£13.02	£13.36			

## APPENDIX II

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No attempt has been made to compile an exhaustive bibliography of the materials consulted in the course of this experiment. So many different publications were used in the attempt to gather information on every aspect of each colony's economic conditions that a complete list would defeat its own end of giving the sources necessary to understand the estimates and to assess their reliability. Those works which were not directly responsible for any estimates or group of estimates are excluded, although they may have contributed to an understanding of the economy concerned. Some of the valuable anthropological studies which were consulted for the purpose of the African estimates were accordingly omitted. On the other hand, in sections 1 and 2 of the bibliography, dealing with methodology and related national income studies, some publications are included which were not available at the time the estimates were made but which might contribute to an understanding of the methods used in, and the wider implications of, this experiment. It should be noted that many of the reports described here as annuals ceased publication during the war and some have not yet been resumed.

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## INDEX

- Abercorn, *see* Northern Rhodesia  
Africans, 7, 70, 152; *see also* Northern Rhodesia and Nyasaland  
African Lakes Corporation Ltd., 54 n.  
*Agriculture in the West Indies, see* Jamaica  
Alcohol or drink, expenditure on, 152; *see also* Northern Rhodesia, Nyasaland, Jamaica  
Allotments, 19, 23, 95  
*An African Survey, see* Hailey, Lord  
Annual estimates, need for, 129, 143 *et seq.*, 147-148  
Animal products, or dairy products or livestock, 36, 61, 71, 76; *see also* Northern Rhodesia, Nyasaland, Jamaica  
Asiatics, 7, 59 n., 60 n.; *see also* Northern Rhodesia, Nyasaland
- Balancing Accounts, *see* Triple-entry balancing accounts  
*Balance of Payments, see* United States  
Bananas, 76; *see also* Jamaica  
Banking, *see* Northern Rhodesia, Nyasaland, Jamaica  
Barbados, 145 n., 157  
Barna, T., 151 n.  
Barotse Province, *see* Northern Rhodesia  
Barter, 58 n.  
Basket-making, 44  
Bates, M. Searle, 79  
Beer, 24, 31, 44, 45, 88  
Beira, Mashonaland and Rhodesia Railways Ltd., 159  
*Bell Report, see under* Nyasaland  
Benham, Frederick, vii, viii, 96 n., 97, 110, 111, 113-115, 117, 157  
Bitterwood, *see* Jamaica  
Blantyre, *see* Nyasaland  
*Bledisloe Report, 158*  
Blood, A. G., 79 n.  
*Board of Trade Journal, see* United Kingdom  
Bowley, Arthur L., 19 n.  
British South Africa Co. Ltd., 159  
Broken Hill, *see* Northern Rhodesia  
Browne, Major J. St. J. Orde, *see* Orde  
Browne, Major G. St. J.  
Budget surplus, *see* Government  
Budget surveys, *see* Family budgets  
Building, *see* Northern Rhodesia, Nyasaland, Jamaica  
Butcheries, *see* Animal products and Distribution  
Butter, 35, 38, 109  
Calories, 43 n.
- Capital, expenditure on grant of, 19; *see also* Northern Rhodesia, Nyasaland, Jamaica  
Cardinal, A. W., 157  
Carey-Jones, N. S., 154  
Cash expenditure or income, *see* Expenditure or income  
Cassava, 41, 42, 76  
Castor oil, 41 n.  
Casual labour, *see* Northern Rhodesia, Nyasaland  
Caterpillar, 44  
Cattle, 35, 37, 108-9, 130, 132  
Census, *see* Northern Rhodesia, Jamaica, Nyasaland  
Central Economic Intelligence Staff, v  
Central Province, *see* Northern Rhodesia  
Central Statistical Office, v  
*Church in the New Jamaica, The, see* Davis, J. Merle  
Citrus fruit, *see* Jamaica  
Clark, Collin, 2, 151 n.  
Clothier, J. N., *see* Northern Rhodesia, ecological survey of  
Clothing, expenditure on, 56, 57, 60; *see also* Northern Rhodesia, Nyasaland, Jamaica  
Coal, 49 n.  
Cocoa, *see* Jamaica  
Coconuts, *see* Jamaica  
Coffee, 35, 71, 74, 107, 108  
Colonial Development and Welfare Act, 129  
Colonial Office, ix, x, xii, 160, 161  
Colonial statistics, *see* Material for estimates  
*Conditions and Cost of Living in the Colonial Empire, 82, 158*  
*Conditions of Economic Progress, see* Clark, Collin  
Copper, *see* Northern Rhodesia  
Cotton, 72, 74, 76, 79, 83  
Crop distribution, *see* Northern Rhodesia, Nyasaland, Jamaica  
Cross-checking, 8, 53, 56, 87, 96, 123; *see also* Northern Rhodesia, Nyasaland, Jamaica  
Cucurbits, 41, 76  
Cundall, Frank, 162  
Customary price, *see* Value
- Dairy products, *see* Animal products  
*Data on the Distribution of the Missionary Enterprise, see* Bates, M. Searle  
Davis, J. Merle, vi, 102 n., 121, 159, 162

- Degree of dependence of selected Colonial territories, 149
- Department of Statistics, Southern Rhodesia, 56
- Depreciation, 9, 16, 33, 49, 106
- De-tribalisation, *see* Wilson, Godfrey
- Development and welfare in the West Indies, *see* Jamaica
- Distribution *see* Northern Rhodesia, Nyasaland, Jamaica
- Direct taxation, *see* Northern Rhodesia, Nyasaland, Jamaica
- Domestic servants, *see* Northern Rhodesia, Nyasaland, Jamaica
- Unpaid, *see* Economic activity, Unpaid labour, Women's activities
- Double counting, 8, 9, 11, 117, 145
- Eastern African Trade and Information Office, 51
- Eastern Province, *see* Northern Rhodesia
- Economic activity
- Definition, 1, 2, 19-21
- Economic producers, 28, 40; *see also* Northern Rhodesia, Nyasaland
- Evaluation, 1, 2, 19-21, 23-4; *see also* Northern Rhodesia, Nyasaland
- Unpaid labour, 2, 19-21, 23-4; *see also* Jamaica, unpaid dependents
- Untraded output, 2, 19-21, 153
- Economic characteristics, 149-52
- Economic Section of the War Cabinet Offices, v
- Economic Journal*, 7 n., 157
- Economics of Detribalisation in Northern Rhodesia*, *Essay on*, *see* Wilson, Godfrey
- Economic Survey of the Colonial Empire*, 132 n., 158
- Eggs, 35, 38
- Elephants, 37, 38
- Encyclopædia of the Social Sciences*, 2 n.
- Engledow, F. L., 161
- Europe, 54
- Europeans in Africa, 7, 59-60; *see also* Northern Rhodesia, Nyasaland
- Expenditure abroad, 12, 13, 22-3
- Permanence of residence, 22
- Evaluation, *see* Economic activity, Northern Rhodesia, Nyasaland
- Exports, *see* Northern Rhodesia, Nyasaland, Jamaica
- Family
- African, 38-40, 68
- Budgets, 8, 55-7, 59, 81
- European, 22-3, 55, 56
- Fell, J. R., 159
- Firewood, 20, 24, 46 n., 115, 116
- Fines, 58
- Fish, 44, 45, 71, 72, 76, 83
- Net-making, 44
- Fish Poison, 41 n.; *see also* Jamaica
- Foreign firms, 14-19; *see also* Nation, Northern Rhodesia, Nyasaland
- Forestry, *see* Northern Rhodesia, Nyasaland, Jamaica
- Food, 60, 151; *see also* Northern Rhodesia, Nyasaland, Jamaica
- Fort Jameson, *see* Northern Rhodesia
- Frankel, S. H., 157
- Fruit, 35, 41, 76
- Furniture, 46, 115, 116
- Fundamental tables, 4, 7 *et seq.*, 21 *et seq.*
- Balance of payments, 13-14, 17-19
- Government accounts, 10-11
- Income-output-expenditure table, 8-12
- National or residents' income and taxable income, 12, 14 *et seq.*
- See also* Northern Rhodesia, Nyasaland, Jamaica
- Game, 37, 38, 44
- Ghee, 71
- Gifts, 9, 58
- Ginger, *see* Jamaica
- Gluckman, Max, 57 n., 154, 159
- Goats, 37, 109, 132
- Gouldsbury, C., 159
- Government, 1, 10-11, 28, 113; *see also* Northern Rhodesia, Nyasaland, Jamaica
- Grain, 41, 76
- Evaluation of, 20, 41
- Groundnuts, 9, 35, 71
- Ground provisions, *see* Jamaica
- Gruenbaum, Ludwig, 157
- Hailey, Lord, 55 n.
- Harvest reports, 40-41
- Hawkers, *see* Northern Rhodesia, Nyasaland
- Hicks, J. R., 156
- Hides, 37, 38, 71, 109
- Honey, 44, 108
- Hornby, A. J. W., 160
- Hotels, *see* Northern Rhodesia, Nyasaland, Jamaica
- Household expenses, *see* Northern Rhodesia, Nyasaland, Jamaica
- House of Commons, 98
- How to Pay for the War*, v
- Howe, Mr., 109
- Imports, 17 *et seq.*
- Retained imports, 17-19; *see also* Northern Rhodesia, Nyasaland, Jamaica
- Imputed rent, *see* Rent
- Income-output-expenditure table, *see* Fundamental tables
- Income-tax returns, 7; *see also* Northern Rhodesia, Nyasaland, Jamaica
- India, population censuses of, ix
- Indians, *see* Asiatics

- Indirect taxes, 10, 11, 13, 20; *see also*  
     Northern Rhodesia, Nyasaland,  
     Jamaica  
 International Missionary Council, vi, 79 n.,  
     157  
 Interplanting, 40  
*Interpretative Statistical Survey of the*  
*World Mission of the Christian Church,*  
     55, 121, 157  
 Investment, 8, 9, 10, 12, 13, 15; *see also*  
     Northern Rhodesia, Nyasaland,  
     Jamaica and Fundamental tables  
 Invisible trade, 13; *see also* Northern  
     Rhodesia, Nyasaland, and Jamaica,  
     under Balance of payments  
 Ironwork, 44  
 Ivory, 37  
  
 Jamaica, 3, 95-141, 142, 143, 145, 146, 148,  
     149, 151, 152  
     Administrative occupations, *see* Clerical  
     and administrative  
     Aerated waters, 110  
     Agricultural Department, 106, 132  
     Agriculture, 37, 96, 99-101, 104, 106-  
         109, 116, 125, 127, 132, 137, 138,  
         148, 150  
         Costs of cultivation, 39  
         *Agriculture in the West Indies*, 96 n.,  
             100 n., 106, 107, 161.  
     Alcohol, Consumption of, 151  
         Industrial, 106, 132  
         Ale and beer, 110  
     Artisans, 130  
     Assessed incomes, *see* Income tax  
     Baking, 114, 116, 124, 133, 138  
     Balance of payments, 121-123, 125, 130,  
         132, 140  
     *Banana Commission, Report of*, 95, 100,  
         131, 161.  
     Banana exporting companies, 99 n., 106  
     Banana industry, 95, 99-100, 104, 106-  
         108, 111, 112, 116, 126, 131, 132  
         137, 138, 148  
         Bunches and stems, 106 n.  
         Home market, 106, 107, 132  
         Rejects, 106-107  
         Yields, 99-100, 107  
     Banana Producers' Association, 99, 106,  
         111  
     Banking, 97 n.  
     Biscuits, 110  
     Bitterwood, 107, 108  
     *Blue Book*, 97 n., 99 n., 101, 102 n., 109,  
         110 n., 114, 161.  
     Bread, 114  
     Building, 110-111, 116, 119, 124, 133,  
         138, 151  
     Bus drivers, conductors or mechanics,  
         101 n., 102 n.  
     Cane farmers, *see* Sugar industry  
     Capital import, 119, 125, 134  
  
     *Census of Population, Jamaica* 95, 97,  
         102 n., 111, 146  
     Charcoal 115  
     *Church in the New Jamaica, The, see*  
         Davis, J. Merle  
     Cigars and cigarettes, 110  
     Citrus fruit, 107, 108  
     Clerical and administrative workers, 97,  
         102, 104  
     Clothing expenditure on, 117, 118, 120,  
         125, 126, 130, 133, 139  
     Clubs, 113  
     Cocoa, 107, 108  
     Coconuts, 107, 108  
     Collector-General, 97 n., 99 n., 100 n.,  
         102, 131  
     Copra and coconut products, 110  
     *Cost of Living of Sugar Workers during*  
         *Crop, Report of Committee on*, 115  
     Cottage industries, 115, 116, 127, 138  
     Count bunch, *see* Payable bunch  
     Crop distribution or land utilisation, 95  
     Cross-checking, 96, 122, 123, 129, 131  
         Balance of payments, 122-123  
         Expenditure with income and output,  
             121  
         Taxable income, output, and expendi-  
             ture (1929-38), 134  
     *Dairy Committee's Report*, 109, 111, 161  
     *Development and Welfare in the West*  
         *Indies*, 96 n., 157, 161  
     Distribution, 97, 98, 101, 102, 104, 105,  
         111-112, 116, 124, 125, 126, 130,  
         131, 132, 133, 137, 138, 151  
     Distribution of income in, 149  
     Domestic service, 97, 102, 104, 113, 116,  
         124, 130, 131, 133, 138, 148  
     Dressmaking, 115, 116  
     Economic characteristics, 3, 95-96, 148,  
         149  
     *Economic Policy Committee, Report of*,  
         98, 105, 117, 161  
     Education, 97 n., 102 n., 113-114  
     Electricity, 110  
     Employment, 98-99, 101-102, 109  
         Seasonal employment, 98, 105  
         Underemployment, 105  
         Unemployment, 97  
     Entertainments, 113, 116, 124, 133, 148  
     Estates and estate owners, 97, 99, 103,  
         104, 130, 131  
     Evaluation, 106 *et seq.*  
     Expenditure estimates, 117-121, 125,  
         126-127, 133-135, 139  
     Exports, 99 n., 106, 107, 109, 121, 123,  
         124, 125, 126, 129-130, 132, 133,  
         135, 140, 141  
     Finance, 97 n., 114, 151  
     Fishing, 97, 101, 102, 104, 109, 116, 125,  
         126  
     Flour, 114, 133

- Jamaica, Food, expenditure on, 118, 120, 126, 133, 139, 151  
 Foreigners' remittances, 117, 118, 120, 122, 123, 125, 134  
 Fuel and cleaning, expenditure on, 118, 120  
 Furniture, 115, 116  
 Ginger, 107, 108  
 Government, 103, 113, 116, 118, 119-120, 122, 123, 124, 125, 126, 127, 130, 134, 137, 138, 139, 140, 150, 151  
   Government or civil servants, 97, 102, 103, 113  
   Printing office, 114  
   Revenue and expenditure account, 120, 130  
 Ground provisions, 108, 116, 124, 132  
 Hairdressing, 115, 116  
 Hotels, 113, 116, 124, 131  
 Housing, 102-103, 115, 116, 124, 138, 151  
 Ice, 110  
 Imports, 108, 114, 121, 122, 123, 127, 129-130, 133, 134, 135, 140, 141  
 Income estimates, 96-105, 131, 132, 135, 137  
 Income from abroad, 103, 104, 121, 122, 124, 125, 126, 127, 132, 138, 140, 151; *see also* migrant labour  
 Income-output-expenditure table, 96, 117, 125, 126, 137-140  
 Income tax returns and assessments, 96, 99, 103, 130, 131, 132, 133, 141  
 Independent workers, 101, 111  
 Indirect taxes, 119, 120, 125, 126, 139  
 Interest, 103, 104, 124, 125, 126, 130, 131, 137  
 Investment, 118-119, 120, 121, 122, 123, 125, 126, 127, 134, 139, 140  
 Jackass rope, 108  
*Jamaica, the Blessed Island*, *see* Olivier, Lord  
*Journal of the Jamaica Agricultural Society*, 106, 107, 109, 113, 132, 162  
 Kingston, 98 n., 101 n., 102 n.  
   *Cost of Living Survey*, 112, 161  
*Labour Conditions in the West Indies*, *see* Orde Browne, Major G. St J.  
 Labourers, 96, 97, 98-99, 102, 103, 104, 105, 121, 122, 123, 124, 125, 126, 127, 130, 131, 132, 137, 140  
 Land utilisation, *see* Crop distribution  
 Laundry, 115, 116  
 Law, 97 n., 113-114  
 Leather and tanneries, 110  
 Legislative Council, 106, 161  
 Livestock, 108-109, 116, 124, 125, 126, 130, 132, 138  
   Costs of production, 109  
 Logwood, 107, 108  
 Jamaica, Lumbering, 115, 116  
   Manufacture, 99, 109-110, 116, 124, 125, 126, 133, 138, 151  
   Margin of error in calculation, 96, 105, 110 n., 112, 113, 121, 123, 128, 135-136, 145  
   Taxable income, 105  
   Manufactured output, 110 n.  
   Distribution, 44, 112  
   Taxable output, 116  
   — expenditure, 121  
   — income, output, and expenditure (1929-38) 57, 135-136, 145  
 Matches, 110  
 Medicine, 97  
   Doctors, 102, 114  
   Dentists, 102, 114  
   Expenditure on, 118, 120  
 Migrant labour, 103, 104, 116, 121-122, 123, 125, 132, 140  
 National expenditure, 126  
 National income, 104 n., 121 n., 122, 124, 126, 150  
*National Income of Jamaica* (1942), *see* Benham, Frederick  
 National output, 126  
   Structure of output, 151  
 Newspapers, 114, 116, 124, 133  
 Note circulation, 130, 131, 133  
 Occupations, 97-98, 102, 105, 146  
 Output estimates, 105-117, 132-133, 134, 138  
 Payable bunch, 106 n.  
 Pensions, 119, 130  
 Personal consumption, 117-118, 120, 125, 126, 133, 139, 151  
 Personal service, 115, 116, 124, 125, 133, 138, 148, 151  
 Pimento, 107, 108, 110  
 Population, *see* Census  
 Predial labour, 130, 131  
 Price or value  
   c.i.f. or import price, 106, 108, 111, 117  
   'Delivered Kingston', 106  
   Factory, 106, 108 n.  
   f.o.b. or export price, 106, 107, 117  
   General index, 130, 133, 135, 141  
   Growers' or producers', 100, 107, 111, 115  
   Market, 106, 117, 120, 125, 126, 139  
   Retail, 109, 114, 115, 117, 130  
 Printing, 114, 116, 124, 125, 133, 138  
 Professions, 97, 101, 102, 103, 104, 105, 113-114, 116, 124, 131, 137, 138, 151  
 Profits, 99-102, 103, 104, 105, 107, 109, 112, 113, 114, 115, 120, 121, 122, 123, 124, 125, 126, 127, 130, 131, 132, 134, 137, 140, 149  
*Public Life and Sport*, 113, 162  
 Public Services Ltd., Jamaica, 121 n.

- Jamaica, Rates, 117, 118  
 Religion, 97 n., 102, 121, 122, 123, 127, 132  
 Rent, 100, 102, 103, 104, 115, 118, 120, 124, 125, 126, 130, 133, 137, 139  
 Residents, 118 n., 126, 127, 141, 140 n.  
 Restaurants, 113  
 Road and construction work, 98, 99, 105 n., 124, 125, 126, 138  
 Rope and sisal products, 108, 110  
 Rum, 106, 108, 134  
 Salaries, 101, 102, 103, 104, 124, 125, 126, 127, 137  
 Shirts, 110  
 Shoe repairing, 115  
 Shop assistants, 102 n., 111  
 Slums, 102 n.  
 Smallholders, 97, 98, 99, 100, 101, 103, 104  
 Sources for estimates, 95-96, 97 n., 115, 129-131, 134-135, 161-2  
 Stevedores, 98, 99, 101 n.  
 Subsidies, 119, 120, 125, 126, 139  
 Subsistence production or income, 95, 100, 148  
*Sugar Commission, Report of West Indies, see Royal Commissions*  
 Sugar industry, 95, 98, 101, 104, 106, 108, 110, 115, 116, 124, 125, 130, 132, 135, 137, 138, 148  
 Sugar Manufacturers' Association, 98  
 Tailoring, 115  
 Taxable expenditure, 116, 117, 118 n., 120, 121 n., 125, 134, 139  
 Taxable income, 103, 121 n., 122, 125, 134, 137, 141, 149  
 Taxable output, 116, 125, 134, 138  
 Ten-years historical series, 95, 128-141, 145, 148  
 Textile industries, importance of, 151  
 Tourists, 121, 122, 123, 147, 130, 132, 140  
 Tourist Board, 132  
 Transport, 97, 101, 102, 112-113, 116, 124, 125, 126, 130, 131, 133, 138  
   Costs of, 107  
   Docks, 99, 113  
   Railways, 112, 113  
   Road, 112-113  
 Unassessed incomes, *see* Income tax  
 Unemployment or underemployment, *see* Employment  
 Unemployment Bureau, 122  
 Unpaid dependents, 97  
 Value, *see* Price  
 Wages, 96, 98-99, 101, 102, 103, 104, 105, 113, 124, 125, 126, 130, 131, 135  
 West Indies Royal Commission (1938-39), *see* Royal Commissions
- Jamaica, West Indies Sugar Commission, *see* Royal Commissions  
*West Indies Yearbook*, 113, 162
- Kenya, 31 n., 55  
 Kepner, C. D., 162  
 Keynes, Lord, v  
 Kingston, *see* Jamaica  
 Kota Kota, *see* Nyasaland  
 Kuznets, Simon, 2, 156
- Labour Conditions in Northern Rhodesia, see* Orde Browne, Major G. St. J.  
*Labour Conditions in the West Indies, see* Orde Browne, Major G. St. J.  
 Land utilisation, *see* Crop distribution  
 Lands, Mines and Surveys Department, *see* Northern Rhodesia  
 League of Nations, Committee of Statistical Experts, v  
 Lewis, W. Arthur, vi, xii  
 Lime, 45  
 Lindahl, F., 19  
 Logwood, *see* Jamaica  
 London, 4, 21, 33, 54  
 Lusaka, *see* Northern Rhodesia
- Macmillan, W. M., 162  
 Malcolm, Dougal O., 159  
 Margin of error, 4-6, 60 n., 135-136, 144-146, 148  
   Basis of assessment, 4-6, 43-44  
   Difficulty of assessment, 4-6, 144-146  
   Historical series, increasing error in, 135-136, 148  
   Sources of error, 145-146; *see also* Northern Rhodesia, Nyasaland, Jamaica  
 Market price, 10, 11, 12, 15, 20, 23  
 Marriage payments, 75 n.  
 Material for estimate, 4, 13, 53, 59, 68, 75 n., 95, 123, 143-145, 152, 154, 156; *see also* under particular items or colonies  
 Maize, 35, 43, 71, 146  
 Meade, J. E., v, vi, xii, 7, 157  
 Mcal, 20, 24, 42, 57  
 Meat, 37, 57, 76, 83, 108-109  
 Merle Davis, J., *see* Davis, J. Merle  
 Migrant labourers, 12, 13, 15 n., 17, 24; *see also* Northern Rhodesia, Jamaica, Nyasaland  
 Milk, 35, 37, 74, 109  
 Millet, 41  
 Milligan, S., 159  
 Mineral industry, *see* Northern Rhodesia  
 Missions, *see* Northern Rhodesia, Nyasaland  
 Mongu, *see* Northern Rhodesia  
 Moore, R. J., 160  
 Mufulira Copper Mines Ltd., 33, 159  
 Murray, S. S., 160

- Nation  
 Definition of, 12, 13, 14-19, 21-23, 68  
 Resident, taxable, 15-19, 152
- National expenditure, 7-8, 9, 10, 12, 13, 15, 20; *see also* Northern Rhodesia, Jamaica, Nyasaland
- National income, 3, 4, 6, 7, 8, 9, 10, 11, 14, 15, 20, 142, 143, 144, 145, 152  
 Annual calculations, need for, 128-129, 142-144  
 Definition, 1, 2, 7-8, 14-18, 19-20, 104 n., 152-153  
 Distribution of, 149  
 Material required for calculation, 7-8, 128-129, 131, 143-144, 146-148  
 Methods of measurement, 7-8, 147  
 Purpose of calculation, 2, 129, 142-145, 149-152  
 Uniform standards, need for, 3-4, 142
- National Income and Outlay*, *see* Clark, Colin
- National Income and Related Totals, Definition and Measurement of the*, *see* Stone, Richard
- National Income of Jamaica*, *see* Benham, Frederic
- National Income Statistics, Report of Subcommittee on*, v
- National Income White Paper*, 1-2, 60, 151 n., 156  
*see also* United Kingdom
- National Institute of Economic and Social Research, v, 3
- National output, 7, 9, 10, 12, 13, 15, 16, 20  
 Gross value and net value, 7, 9, 16-17
- Natives, *see under* Africans
- Nchanga Consolidated Copper Mines Ltd., 159
- Nkana, *see* Northern Rhodesia
- Northern Province, *see* Northern Rhodesia
- Northern Rhodesia, 3, 4, 7, 17 n., 18 n., 21-67, 68, 74, 75 n., 77, 80 n., 81, 83, 87, 88, 89, 95, 142, 143, 144, 145, 146, 149, 150, 151, 152, 153, 154-155, 158-160
- Abercorn, 39 n., 43 n.,  
 Africans, 7, 23, 24, 152
- African agriculture, 38-44, 52, 61, 64, 74, 146, 155  
 Animal products, 36-37, 61, 64  
 Arts and crafts, 44, 45  
 Consumption, 57-58, 59, 62, 64, 66;  
*see also under* Expenditure  
 Earnings, 28-31, 51, 52, 57, 61, 64-65, 66, 87-88, 149-150, 155  
 Economic producers, 41; *see also*  
 Northern Rhodesia: Economic production  
 Employment, 28-30, 51  
 Expenditure, 56-58, 64-65  
 Farmers, 30, 40, 41, 42  
 Hawkers, 47, 48  
 Housing, 46-47, 51, 52  
 Northern Rhodesia, Incomes, *see under*  
 Earnings  
 Independent workers, 30-31, 51  
 Industry, 44-45, 52  
 Man-months worked, 29, 39 n.  
 Migrant labourers, 24, 31-32, 39-40, 53, 54-55, 67, 150  
 Population, 39, 57, 87 n.  
 Productive population, 39-40  
 Rural population, 39-40  
 Subsistence producers, 23, 30, 32, 40;  
*see also* Northern Rhodesia: Subsistence production and Northern Rhodesia: Subsistence consumption  
 Tax, 39, 57  
 Traders, 47, 48  
 Village population, 39-40  
 Women, *see* Women's activities
- Agricultural areas, 38, 39, 40  
 Agricultural Department, 35, 36, 40  
 Agriculture, 66, 151; *see also* African and European agriculture  
 Alcohol, expenditure on, 56  
 Animal products, *see* African and European livestock  
 Asiatics, 7, 59 n.  
 Earnings, 31, 32, 47-48, 51, 52, 57, 61, 62, 64, 66, 149-150, 152, 155  
 Expenditure, 57, 60 n., 62 n., 64, 66, 155  
 Shops, 47-48
- Balance of payments, 53-55, 56, 67
- Banking, 51, 52, 55, 61, 64
- Barotse Province, 40, 42, 43, 47, 57 n.
- Blue Book*, 25, 48, 86, 87 n., 158
- Broken Hill, Godfrey Wilson's survey of, 28, 30, 31 n., 55, 57, 160
- Building, 29, 46-47, 61, 62, 63, 64, 66, 151
- Capital, Expenditure on, 44, 55, 57, 58  
 Movements, 62, 63
- Casual labour, 28, 36
- Cattle Marketing and Control Board, 37
- Central Province, 40, 42, 43
- Census, 25, 26, 27, 158
- Clothing, expenditure on, 56, 57, 64
- Coloured population, 31
- Committee to consider means of reducing costs of transport, 50, 159
- Copper companies, *see* European companies
- Corp distribution, 39, 40
- Cross-checking, 58, 59, 60, 61, 62, 63  
 Agriculture, 36  
 African and Asiatic income, output, expenditure, 51, 57  
 Distribution, 48  
 European income, output, expenditure, 51, 52, 56  
 Forestry, 46  
 Railways, 49

- Northern Rhodesia, Subsistence production and consumption, 57-58  
 Total income, output, and expenditure, 52, 59-63  
 Customs Department, 33, 45, 49, 54  
 Direct taxes, 58; *see* Income tax; African tax  
 Disinvestment, *see* Investment  
 Distribution, 47-48, 52, 55, 61, 62, 63, 64, 66, 151, 155  
 Distribution of income, 149-150  
 Domestic servants, 30, 51, 52, 61, 65  
 Double taxation, 28  
 Eastern Province, 40, 42, 43  
 Ecological survey, 38, 39, 40, 43, 44, 75 n., 154  
 Economic characteristics, 3, 21-25, 149-152  
 Economic production, 30, 41, 42, 44, 51, 58, 61  
 Entertainments, 51, 52  
 European, 7, 12, 149  
   Agriculture, 35-36, 61, 64, 155  
   Commitments abroad, 22-23, 55  
   Consumption, *see under* Expenditure  
   Earnings, 22, 25-27, 47, 48, 49, 51, 56, 60, 61, 64, 66, 89  
   Expenditure, 55-56, 60, 64, 150, 152, 155  
   Farmers, 26, 35, 36 n.  
   Foreigners, *see under* Non-residents  
   Government employees, 26, 88  
   Housing, 51  
   Incomes, *see under* Earnings  
   Leave pay, 55  
   Livestock, 36-37  
   Miners, 26, 34  
   Occupations, 25-27  
   Pensions, 32  
   Population, 25  
   Railway employees, 27  
   Rents, 23, 36, 51  
   Residents and non-residents, 21-23, 52, 55, 56, 59, 60, 61, 64, 66, 149, 150, 155  
   Traders, 47, 48  
 European companies  
   Assessment year, 27  
   Copper companies, 17 n., 27-28, 33-34  
   Earnings, 21-22, 27-28, 32, 33-34, 45-46, 47, 48, 49, 52  
   Foreign or resident companies, 14-19, 27-28, 52, 61, 65, 67, 149  
   Mineral companies, 27-28, 33-34, 48 n., 52, 53, 54  
   Railway company, 27, 28, 48-49, 52, 55  
   Remittances abroad, 53, 58  
   Tax payments, 27, 28, 52 n., 54, 62, 63  
   Trading companies, 47, 48
- Northern Rhodesia, Evaluation, 23-24, 39, 41, 42, 43, 54, 57-58  
 Exports, 35, 36, 53, 54, 55, 62, 63, 67  
 Faunal survey, 38  
 Food, expenditure on, 56, 57, 58  
 Foreign companies, *see* Northern Rhodesia: European companies  
 Foreign investment, *see* Investment  
 Foreign property, income from 53, 67  
 Forestry, 45-46, 61, 64, 155  
   Northern Forestry Division, 46 n.  
 Fort Jameson, 39 n., 43 n.  
 Government, 26, 28, 50, 51, 52, 55, 58-59, 61, 62, 63, 64, 66, 67, 150, 151, 155  
 Hawkers, *see* Africans  
 Hotels, *see under* Personal services  
 Household expenses, 56  
 Housing, 50, 51, 61, 151, 155; *see also* African, European  
 Imports, 33, 38, 48, 49, 50, 53, 54, 55, 57  
   Transport costs, 54  
   Of capital, 53, 55, 62, 63  
 Income-output-expenditure table, 64-65, 66  
 Income tax, 25, 26, 27, 28, 32, 52, 54, 62 n., 63 n.  
 Indians, *see* Asiatics  
 Indirect taxes, 58, 64, 66, 150, 154  
 Investment and disinvestment, 50 n., 54, 56, 57, 63 n., 64-65, 66, 67, 155  
*Labour Conditions in Northern Rhodesia*, *see* Orde Browne, Major G. St J.  
 Lands, Mines and Surveys Department, 26, 33  
 Lusaka, 39, 43  
 Manufactures, 62, 63, 66, 155; *and as for* Secondary industries  
 Margin of error, 4, 60, 87-89, 145, 146  
   African earnings from employment, 29  
   Agricultural output, 36, 42  
   Animal products output, 37-38  
   Cash income, 60  
   Distribution output, 48  
   European earnings, 26  
   — companies' income, 28  
   — expenditure abroad, 55  
   Forestry output, 46  
   Import of capital, 55  
   — of merchandise, 54  
   Mineral output, 35  
   National income, 32, 60  
   Native industry, 45  
   Railway output, 49  
   Secondary industry, 45  
   Subsistence output, 42, 58  
   Transport output, 50  
 Market-garden crops, 35  
 Mat-making, 45  
 Migrant labour, *see* African  
 Missions, 29, 53, 55, 67  
 Mongu, 39, 43



- Northern Rhodesia, Mining, 25, 26, 27, 29, 33-35, 61, 62, 63, 64, 66, 151, 155  
 National expenditure, 22, 23, 53, 66  
 National income, 21, 22, 24, 32, 52, 60, 66, 145, 146, 149, 153  
 National output, 34, 51, 66  
   Structure of output, 151  
 Native Affairs Department, 28, 30, 41, 42, 43, 47  
 Nkana, 39, 43  
 Northern Forestry Division, 46 n  
 Northern Province, 40, 41, 42, 43, 44, 47  
 Personal services, 26, 50, 51, 52, 56, 61, 64  
 Population, 87 n  
 Preliminary estimates, 21, 154-155  
 Price, *see* Value  
 Professions, 11, 26, 51, 52, 61, 65  
 Prostitution, 25, 31  
 Railways, 26, 27, 48-49, *see also* European companies  
   Railway belt, 50  
 Rations, 28, 29, 30, 57, 58  
 Religion, 26, 50, 52, 61, 65  
 Rent, 26, 34, 36, 46, 47, 48, 49, 51, 56, 57  
 Residents' income, expenditure or output, *see* National expenditure, income or output  
 Royalties, 27, 28, 34  
 Sawmilling, *see* Forestry  
 Secondary industry, 45, 61, 64  
 Southern Province, 40, 41, 42, 43  
 Standard of living, 22, 43, 60  
 Statistics, *see* Material for estimates  
 Subsistence consumption, 57-58, 59  
 Subsistence economy, 23, 59, *see also* African subsistence  
   Subsistence output or subsistence production or subsistence income, 23-43, 30 n, 32, 41, 42, 43, 52, 58, 60, 61, 64, 87, 143, 154, 155  
 Taxable expenditure, 155  
 Taxable income, 24, 32, 52, 61, 62, 64-65, 149, 150, 155  
 Taxable output, 34, 35, 62, 64-65  
 Teaching, 29  
 Temporary residents, 22-23, 55, 59-60  
 Tourists, 53, 55, 67  
 Trade and commerce, 26, 29, 42, *see also* Distribution  
 Transport, 48-50, 52, 54, 61, 62, 63, 64, 66, 151, 155, *see also* Railways  
 Urban cultivation, 44  
 Value or price  
   Customary, 23-24  
   Farm, 35, 37  
   Free on rail, 46, 54  
   Local, 39, 43  
   London market, 33, 54  
   Lusaka, 43  
   Market, 23, 39, 64, 66
- Northern Rhodesia, value or price, Retail, 43 n, 55  
   Wholesale, 36, 38  
 Veterinary Department, 37  
 Western Province, 40, 41, 42, 43
- Nyasaland, 4, 7, 21 n, 31 n, 68-94, 95, 142, 143, 144, 145, 146, 149, 150, 151, 152, 153, 160-1
- Africans, 87, 88, 149, 153  
 Absentees, *see under* Migrant labourers  
 Agriculture, 68, 74-77, 81, 83, 89, 90, 93, 146  
 Alien labourers, 74  
 Animal or dairy products, 72, 76  
 Consumption, *see under* Expenditure  
 Earnings, 70-73, 77, 79, 80, 81, 84, 87-88, 89, 90-91, 93, 149, 150  
 Economic producers, 70, 72 n, *see also* Economic production  
 Employment, 71, 90-91, 93  
 Expenditure or consumption, 83-84, 87, 89, 90-91, 93, 150  
 Farmers, 71, 72, 73  
 Fishermen, 71, 72, 73  
 Hawkers, 71 n, 72, 77  
 Housing, 80  
 Income, *see under* Earnings, African  
 Independent workers, 33, 72, 73, 78, 80, 83, 84, 91  
 Industry, 83  
 Migrant labourers, 71 n, 72-73, 84 n, 86, 88, 91, 92, 93, 94, 149, 150  
 Occupations, 70  
 Population, 80 n, 83, 87  
 Subsistence producers, *see* Subsistence income  
   Wages, 70-71, 73, 74, 84  
 Agricultural Department, 71, 73, 74  
 Agricultural districts, 75  
 Agricultural surveys, 64, 74-77, 160  
 Alcohol or drink, expenditure on, 82, 89  
 Anguru, 71 n, 73  
 Animal products, *see* Africans, Europeans' livestock  
 Asiatics or Indians, 7, 31 n, 86  
 Consumption, *see under* Expenditure  
 Earnings, 70, 73, 77, 79, 89, 90-91, 93, 149, 150  
 Expenditure or consumption, 81, 82 n, 84, 89, 90-91, 93, 150, 152  
 Income, *see under* Earnings  
 Balance of payments, 81, 86-87, 92, 94  
 Banking, 70, 79, 80, 81  
 Bell Report, 69, 70, 71 n, 72, 73 n, 78, 82 n, 85, 160  
 Blantyre, 74  
 Blue Book, 71, 72, 77, 78, 79, 80 n, 81, 83 n, 85, 86, 87 n, 160  
 Building, 71, 80, 81, 89, 90-91, 93, 151

- Nyasaland, Census, 69, 71 n., 72, 80 n., 160; *see also* Labour census and Occupation census
- Clothing, expenditure on, 82, 83, 84, 89, 90-91
- Crop distribution, 76
- Cross-checking
- African income and expenditure, 83, 84
  - Agriculture, income and output, 74
  - Asiatic income and outlay, 84
  - Companies' income and outlay, 85
  - Distribution, income and outlay, 77
  - European income and outlay, 82
  - Income, output, and expenditure, 89 (table)
  - Missions, income and output, 79
  - Northern Rhodesia, 87-89
  - Taxable income and output, 81, 89
  - Total residents' national income, 87
  - Transport, income and output, 78
  - Subsistence production, 83-84, 89
- Direct taxes, 82, 84, 85, 89, 150; *see also* Income tax, Poll tax
- Distribution, 77, 80, 81, 82, 89, 90-91, 93, 151
- Distribution of income in, 149, 150
- Domestic service, 71, 80, 82, 89, 90-91
- Economic production, 70 71, 72 n., 89
- European, 7, 86
- Agriculture, 69, 73-74, 81, 82 n., 85, 89, 90-91, 93
  - Assessed to income tax, 69
  - Civil Servants, 69, 82, 89
  - Company employees, 69 n.
  - Consumption, *see under* Expenditure
  - Earnings or incomes, 69-70, 73, 74, 77, 78, 79, 80, 81, 88, 89, 90-91, 93, 149-150
  - Expenditure or consumption, 81-82, 83, 84, 89, 90-91, 92, 93, 94, 150, 152
  - Housing, 80
  - Incomes, *see under* Earnings
  - Livestock and dairy products, 74
  - Missionaries, 69, 82
  - Occupations, 69
  - Pensions, 79
  - Residents, 86, 87, 89, 93, 149, 150, 151
  - Traders, 77
- European companies, 68
- Banking and insurance, 70, 79, 80, 81, 85 n., 86
  - Earnings, 69-70, 73, 74, 77, 78, 80, 85, 89, 90-91, 93
  - Financial companies, 89, 90-91
  - Foreign companies, 85, 86, 87
  - Railway and shipping companies, 70, 78, 85, 86
  - Remittances abroad, 85, 86, 90-91, 92, 93
  - Resident or local companies, 82, 85
- Nyasaland, Tax payments, 69, 85, 89 n.
- Tea companies, 70, 85
  - Tobacco companies, 70, 85
  - Trading companies, 70, 77, 85
- Evaluation, 71 n., 77
- Exports, 73, 86, 92, 94
- Food, expenditure on, 82, 83, 84, 89, 90-91
- Output of, 83
- Government, 69, 70, 71, 73, 78 n., 79, 81, 84, 85, 86, 89, 90-91, 92, 93, 94, 150, 151
- Handbook, 77, 160
- Hawkers, *see* Africans
- Hotels, 79, 80, 81, 89, 90-91
- Household expenses, 82, 84
- Housing, 80, 89, 90-91, 151
- Imports, 81, 83, 86, 92, 94
- Income-output-expenditure table, 36, 90-91, 93
- Income tax, 69, 70, 85, 89 n., 150
- Indirect taxes, 85, 90-91, 93, 150
- Investment, 37, 82, 84, 85, 86, 89, 90-91, 93, 94
- Kota Kota, nutrition survey in, 75-76, 88
- Labour census, 70
- Labour Department, 70 n., 84
- Missions, 69, 79, 81, 86, 89, 90-91, 92, 93, 94
- Manufacture, 71, 79, 80, 89, 90-91, 93, 151
- Margin of error in calculation, 87-88, 145, 146 n.
- African agricultural output, 76, 83
  - Cash output, 80
  - Subsistence output, 83
  - Taxable income, 73
  - Tea industry output, 73
- National or residents' expenditure, 89, 93
- National or residents' income, 87, 89, 93, 142, 149, 150
- National output per head, 87, 93
- Structure of output, 151
- Native, *see* African
- Northern Province, 68, 72, 75, 76, 77
- Nutritional Review of the Natives of Nyasaland*, 41 n., 83, 160
- Occupation census, 70
- Poll tax, 69
- Price, *see* Value
- Public Works Department, 71
- Professions, 80, 81, 89, 90-91
- Railways, *see* Transport
- Rates, 82, 89
- Rations, 83
- Rent, 82, 83, 89, 90-91
- Southern Province, 68, 75, 76
- Statistics, *see* Material for estimate
- Subsidies, 85, 90-91

- Nyasaland, Subsistence income or output, 73, 76 n., 80, 81 n., 83, 84, 88, 89, 90-91, 93  
 Taxable expenditure, 90-91  
 Taxable income, 73, 89, 90-91, 149  
 Taxable output, 80, 81, 90-91  
 Tobacco, expenditure on, 82, 89, 90-91  
 Tobacco industry, Report on, 71 n., 161  
 Tourists and transmigrants, 86, 92, 94  
 Trading tax, 77  
 Transport, 78, 80, 81, 85, 89, 90-91, 93  
   Carrier (portage), 78  
   Lake or river (shipping), 70, 78  
   Railway, 70, 78, 88  
   Road, 78  
 Value or price  
   Export value, 73  
   Growers' price, 73, 74  
   Retail price, 74  
   Market price, 90-91, 93  
 West Nyasa, 72
- Objects of enquiry, 0, 3-4, 128, 142-143  
 Ogilvie, F., 162  
 Olley, Phillip, P., 162  
 Olivier, Lord, 97, 100, 122, 162  
 Orde Browne, Major G. St J.  
   *Labour Conditions in Northern Rhodesia*, 51 n., 63, 158  
   *Labour Conditions in the West Indies*, 96, 97 n., 99 n., 105, 122, 161  
 Output, *see* National output  
   Gross output, 16  
   Net output, 7, 12, 16  
 Overseas travel and travel expenditure on the balance of internal payments of the U.S. (1919-38), *see* United States
- Panama Canal, *see* United States  
 Parquet blocks, 46  
 Pigou, A. C., 157  
 Pigs or swine, 37, 109  
*Pim Report*, 26, 27 n., 28, 29, 36 n., 38 n., 44, 51, 158  
 Pim, Sir Alan, *see Pim Report*; *also* Kenya, *Pim Report* on  
 Pimento, *see* Jamaica  
 Pitman, Capt. S. R., 159; *see also* Faunal survey of Northern Rhodesia  
 Platt, B. S., vi, 75, 76, 80 n., 88  
 Potatoes, 35  
 Poultry, 35, 37, 38  
 Powell, H. Clarke, 162  
 Primary industries, 151  
 Public finance, *see* Government  
 Productive units, 39, 40, 68, 75  
 Professional services, output of or expenditure on, *see* Northern Rhodesia, Nyasaland, Jamaica  
 Prostitution, 24, 25; *see also* Northern Rhodesia  
 Pulses, 41, 57, 76
- Railways, *see* Northern Rhodesia, Nyasaland, Jamaica  
 Materials, 49  
 Sleepers, 46  
 Rao, V. K. R. V., 157  
 Rates, 56  
 Rations, *see* Northern Rhodesia, Nyasaland  
 Read, Margaret, 161  
 Ready-made clothing, 45  
*Redistribution of Incomes through Public Finance*, *see* Barna, Tibor  
 Religion, *see* Northern Rhodesia, Nyasaland, Jamaica  
 Relishes, 57  
 Rent, 7, 9, 10, 12, 15, 16, 17, 20, 89, 90-91  
   Imputed rent, 19, 23, 51, 80, 83, 115; *see also* Northern Rhodesia, Nyasaland, Jamaica  
 Retail sales statistics, 8, 59  
 Rhodesian Broken Hill Development Company Ltd., 33 n., 159  
*Rhodesia-Nyasaland Yearbook*, 77  
 Rhodesia Railways Ltd., 26, 27, 48, 159  
 Rhodes-Livingstone Institute, 28 n., 57 n., 159, 160  
 Rhokana Corporation Ltd., 33 n., 159  
 Rice, 71, 76  
 Richards, Audrey, 44 n., 154, 160  
 Roan Antelope Copper Mines Ltd., 33 n., 159  
 Rothbart, Erwin, v  
 Root crops, 41, 57, 76  
 Royal Commissions  
   *Bledisloe Report on Rhodesia-Nyasaland*, 158  
   Sugar Commission, West Indies, 95, 106, 161  
   West Indies Commission (1938-39), 96, 99, 100, 101 n., 102, 103, 104, 106, 107, 108, 110, 111 n., 112, 122, 128, 130, 132, 161  
 Royalties, *see* Northern Rhodesia  
 Rubber, 74  
 Rum, *see* Jamaica
- Salt, 44, 45  
 Sawmilling, *see* Forestry  
 Searle Bates, M., *see* Bates, M. Searle  
 Secondary industries, 151; *see also* Northern Rhodesia, Nyasaland, Jamaica  
 Sheane, H., 159  
 Sheep, 37, 108  
 Shifting cultivation, 46 n.  
 Sisal, 74, 108  
 Skins, 37, 38, 71, 109  
 Soap, 45, 79, 110  
 Soothill, J. H., 162  
 Southern Province, *see* Northern Rhodesia, Nyasaland  
 Southern Province, 24, 31, 41, 48, 54, 55, 56, 81  
 Soya beans, 74

- Spearhead of Africa's Advance*, 79  
 Spearpoint, F., 160  
 Standard Fruit Co. Ltd., 121  
 Standard of living, 2, 22, 60  
 Stone, Richard, v, xii, 3, 7, 157  
 Subsidiary crops, 41  
 Subsidies, 11; *see also* Northern Rhodesia, Nyasaland, Jamaica  
 Subsistence production  
     Definition, 2, 19, 20  
     Evaluation of, 20-21, 145-146, 153  
     Importance in Central Africa, 2, 68, 95, 143-144  
     In national income tables, 19-21, 68, 95, 143-144  
     *See also* Northern Rhodesia, Nyasaland, Jamaica  
 Sugar cane, 16  
 Sugar industry, *see* Jamaica  
 Sweden, 19 n.  
 Tanganyika, 41  
 Taxable income, 15, 17, 104 n.; *see also* National income, Northern Rhodesia, Nyasaland, Jamaica  
 Tea, 27, 70, 73, 74, 79, 82 n  
 Temporary residents, *see* Nation  
 Tertiary industries, 151  
 Ten-year historical series, *see* Jamaica  
 Timber, 45-46  
 Tobacco, 35, 41 n., 45, 71, 73, 74, 76, 82, 83, 107, 108  
     Expenditure on, *see* Northern Rhodesia, Nyasaland, Jamaica  
     Industry, Report on, *see* Nyasaland  
 Tothill, J. D., 157  
 Tourists, *see* Northern Rhodesia, Nyasaland, Jamaica  
 Transfer incomes, 9, 11, 58  
 Transport, *see* Northern Rhodesia, Nyasaland, Jamaica  
 Trapnell, C. G., 154, 159; *see also* *Economic Survey*  
 Triple-entry balancing account  
     Advantages, 8, 129, 142-143, 144  
     Application to Central Africa, 59-60, 142, 143, 144  
     Material required for, 147-148  
     Subsistence output in, 143-144; *see also* Fundamental tables  
 Tsetse fly, 36  
 Uganda, 41  
 Union of South Africa, 24, 31, 54, 72  
 United Fruit Co. Ltd., 121  
 United Kingdom, 1, 2, 3, 4, 6, 7, 8, 14, 21, 22, 24, 25, 54, 72, 86, 95, 121, 132, 142, 143, 144, 145, 149, 150, 151, 152, 154, 156, 158, 160, 161  
     Board of Trade, 121, 132 n.  
     Official national income estimates, 1, 14, 22 n., 60, 142, 144, 151 n., 152; *see also* *National Income White Paper*  
     Structure of national output, 151  
 United States, 2, 6, 54, 103, 121, 132, 145, 152  
     Panama Canal zone, 103, 130, 132  
     U.S. Department of Commerce, 121, 162  
 Universities' Mission to Central Africa, 79, 161  
 Unpaid labour, *see* Economic activity  
 Untraded output, *see* Economic activity  
*Utilisation of Animal By-products in the Colonial Empire, Report on*, 37, 108, 158  
 Value, *see* Northern Rhodesia, Nyasaland, Jamaica  
 Vegetables, 57, 71, 76  
 Western Province, *see* Northern Rhodesia  
 West Indian Sugar Co. Ltd., 121  
 West Nyasa, *see* Nyasaland  
 Wheat, 35, 71  
 White ants, 44  
*White Paper on National Income, see National Income White Paper*  
 Wild foods, 44, 88  
 Wilson, Godfrey, 28, 30, 31 n., 55, 57, 154, 160  
 Women, 38 n., 39  
     Activities, 20-21, 39-40, 41, 72 n., 153  
     Earnings, 30  
     Productivity, 39, 40, 41, 75  
 Wood, G. E., 157  
 Woodwork, 44  
 Yields, 40-41, 75, 76, 100, 147, 154  
 Zambesi Saw Mills Co., 45-46